VOL. XXXII. CLEVELAND, AUGUST 24, 1905. No. 8.

ADDRESS OF LEMIEUX AT SAULT STE. MARIE

Hon. Rudolph Lemieux, solicitor general of Canada, delivered a splendid address at the semi-centennial exercises at Sault Ste. Marie in commemoration of the completion of the first canal. He said:

"I need not say how proud I feel to be the guest of the American government on this, the semi-centennial celebration of the construction of the Sault Ste. Marie canal, the great connecting link between the waters of Lake Superior and Lake Huron. In the name of the Canadian government, which it is my happy privilege to represent officially with my distinguished friend the speaker of the senate, let me offer my sincere thanks to the members of the committee, who have so successfully organized this demonstration, and the American citizens, who have extended to me such a hearty welcome. Sir, if ever there was an occasion when both Americans and Canadians should unite in the celebration of an event calculated to bring, nay, to assure, peace and harmony between the two countries, this indeed was the most fitting, the most appropriate. The great republic and the Dominion of Canada, must and will, I trust forever, in their respective sphere of influence, look for no other rivalry on this broad continent than that which is the direct outcome of the arts of peace. Here are two countries existing side by side, with the same boundary for 4,000 miles, each of them possessing about 3,000,000 square miles of territory, with railways binding them together, with watercourses of a gigantic magnitude inviting communication, with geographical conditions knitting them closely together, with a similarity of races, laws, religion, and to a certain degree, of popular institutions. Can it be doubted that with the good will of both and with a fair policy in matters concerning trade relations, there is not in store for them a future of such brightness as will overshadow the records of all other nations, past or present?

"One of the great factors in the future development of both countries will be the immense resources—I should say the inexhaustible riches—in the great western land. What was practically a lone land only a few years ago, what some of the old men in the last generation knew only as a solitude, has become the granary of the world, the new field, the new promised land where millions of people have settled permanently and where the hum of industry and commerce has replaced the incessant bloody conflicts between Indian tribes. Sir, it has been said that there is no more potent factor of civilization than commerce. If it be true, then I say that fifty years ago, when the American government decided to build this canal in order to stimulate the interchange of trade between the west and the east, it rendered the whole continent a most valuable service. For many years, in fact until recently, we in Canada, shared with you the advantages accruing from the canal, but as we emerged from boyhood to manhood we decided to get for our own territory what you have obtained for yours. This duality is not a sign of hostility. It is, I am pleased to say, a sign of friendly rivalry.

"It has, for the present at least, brought to completion our great canal system. I need not dwell at any length on its importance. Let it be said, however, in view of the results already attained, that it is of such a comprehensive character that it has, and will as heretofore enable Canada to compete successfully for the transit trade of the great western country and the development of cheap routes of communication with the principal markets of the world. It has stimulated the commercial development of the whole dominion and bound all sections together in the bonds of mutual amity and interest. We in Canada believe that the expense of such improvements is insignificant compared with the direct benefits commerce has derived from it.

"We believe also that the supremacy of the carrying trade of the great west will be in the near future between New York, Montreal and Quebec. Nature has given those cities the advantage of position and route, and, speaking more especially for Montreal and Quebec, I can safely predict for them a foremost position amongst commercial communities. When a vessel of 13 or 14 ft. draught can load at Fort William and proceed through the great lakes to Montreal or Quebec without breaking bulk and return laden with goods, transportation will be brought down to its cheapest terms.

"The French had long before the cession of Canada to England, understood the necessity of using in the interest of trade, the large water stretches. Small locks for batteaux had even been constructed by them at the Cascades, the Coteau, the Long Sault, and, if I mistake not, on the Canadian side of the Sault Ste. Marie falls. As far back as 1804, these were reconstructed at larger size and in improved positions by the royal engineers, as military works. While furs were the only exports the batteau was suited to the trade in both directions, but when agricultural export commenced, grain was first

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sent down, and that before 1800, on the rafts, and in scows, which were broken up and sold in Montreal.

"It was the agitation of the Erie and Champlain canals which early drew the attention of the Canadians to the competition with which they were threatened. It was, so to say, a renewal of that strife for the commerce of civilization which had existed for the fur trade between the English colonies and Montreal and Quebec before 1759. In this, as in many other things, our enterprising neighbors have set up the example of activity, energy and commercial genius.

"It was in 1817 that the canal bill passed at Albany. In the month of November, 1817, the projects of connecting lakes Erie and Ontario by the Welland canal first appeared in print. In 1818 a company was incorporated to construct the Lachine canal, and another in 1819 for the construction of the Chambly canal. Thus, movements were set on foot to compass the objects aimed at by the state of New York before the completion of her canals had demonstrated their success.

"But what a change has taken place since those eventful days through the construction of the canals! The old voyageurs on their way from Montreal to Lake Superior went up the Ottawa and across to Georgian bay, portaging their boats when necessary. What a marvelous development this canal system has given to the western trade. In the early years of the eighteenth century, not to speak of the time of the French domination, the cost of carriage by every conveyance then in use, was simply enormous. In his Early History of Inland Navigation, Mr. Castell Hopkins makes a very interesting comparison between the pioneer methods of carrying products with our days of swift transportation.

"A bushel of Indian corn cost by the time it reached Grand Portage, about 30 miles above Fort William, 20 shillings, sterling, and Sir Alexander MacKenzie tells us it was the cheapest article of provision the Northwest company could feed its men with in the first year of that century. For the same sum, ten bushels of corn can now be purchased in England, after having been carried a thousand miles in the interior of America and across the Atlantic. Before the Rideau and St. Lawrence canals were built, the carriage of a 24-lb. cannon between Montreal and Kingston cost between £150 and £200. In those days eighteen bushels of wheat were required to pay for a barrel of salt, and one bushel of wheat for a yard of cotton.

"Sir, one cannot stand on this spot without recalling to his memory the men, who, it is conceded by every one conversant with history, were the pioneers of the great western land. The first civilized men who pierced the interior of the continent were French adventurers, missionaries and traders from old Canada, while the country was in possession of France. The exploits of these men, who, without the slightest knowledge of the territory, penetrated among numerous savage tribes, remains of thrilling interest. Finally they passed from the St. Lawrence through the great lakes of Huron and Superior, and by the innumerable intricacies of streams, lakes and portages to Lake Winnipeg. Then they ascended the river Saskatchewan to about 103 degrees meridian, where they planted their most distant trading post until 1731, when La Verendrye and his sons advanced further in the prairies than any of their predecessors.

"Let me briefly refer to some of the names which would alone immortalize the memory of France on this vast continent. It is Champlain, the founder of Quebec, who discovered Lake Champlain in 1609, the Ottawa river in 1613, Lake Ontario and Lake Nipissing in 1615, and Lake Huron in the same year. It is Jean Nicolet, who in 1634 discovered Lake Michigan. It is Chaumonot and Brebeuf, who discovered Lake Erie in 1640, whilst Lake Superior was first visited by some unknown coureurs des bois in 1659. It was on June 17, 1673, that Joliet and Marquette first sighted the upper waters of the Mississippi, when they paddled down the river past the mouths of the Illinois, the Missouri and the Ohio. Nicolas Perrot was the first European to stand upon the site of Chicago, and the whole great lake region was first formally annexed to France by the Intendent Talon. Who will ever forget the names of Cavelier de LaSalle, de la Verendrye, Albanel and Hennepin?

"I notice with great pleasure that our friends across the border, practical and matter of fact as they are, have remembered the heroic struggles of those pioneers. Cities, towns and villages bear the names of the French discoverers, whilst under the dome of the capitol at Washington, the statue of that great Jesuit missionary, Father Marquette, stands before the world. The great historian, Parkman, who has so vividly depicted the struggles of France and Great Britain for the supremacy of North America, has also published chapters of the most intense interest on the early days of French domination over the great lakes. I have just quoted the name of Intendent Talon, one of the most remarkable men of the French regime. His name must forever be associated with the Sault Ste. Marie, because it is under his guidance and orders, that on this very spot where we stand to-day, the proclamation by which the king of France took possession of the whole western land, was read. He was probably the most efficient intendent that the French kings ever sent to America. He dreamt of a great French empire on the continent of America. In the words of Parkman: 'He meant to occupy the interior of the continent, control the rivers, which were its only highways, and hold it for France against every other nation. On the east, England was to be hemmed within a narrow strip of seaboard; while on the south, Talon aimed at securing a port on the Gulf of Mexico, to keep the Spaniards in check, and dispute with them the possession of the vast regions which they claimed as their own.'

"Such was, sir, the dream of Jean Talon, and for the realization of such a dream, what were his instruments? A few Jesuit missionaries, some adventurous officers, coureurs des bois, fur traders, hunters and explorers. In 1670, he ordered Daumont de Saint-Lusson to search for copper mines on Lake Superior and at the same time to take formal possession of the whole interior for the king.

"I wish I could relate the long and eventful journey of Saint-Lusson and his companion, Nicolas Perrot, the celebrated voyageur, from LaChine to Sault Ste. Marie; how in their frail embarkations they reached the coveted goal, after having invited all the Indian tribes roving around the lakes to attend the great ceremony of June 14, 1671.

"On that date, here at Sault Ste. Marie, at the foot of the rapids, were present Saint-Lusson, Nicolas Perrot, four Jesuits, Claude Dabion, Gabriel Druilletes, Claude Allouez and Louis Andre, and fourteen tribes with their chiefs. On the top of the hill, had been erected a large cross and besides, a post of cedar had been planted, bearing the royal arms. Father Dablon first blessed the cross while the Frenchmen sang 'Vexilla Regis'; and then, Saint-Lusson advanced, and holding his sword in one hand, and raising with the other a sod of earth, proclaimed in a loud voice: 'In the name of the most high, mighty, and redoubted monarch, Louis XIV of that name, most Christian king of France and Navarre, I take possession of this place Sainte Marie du Sault, as also of lakes Huron and Superior, the island of Manitoulin,

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and all countries, rivers, lakes and streams contiguous and adjacent thereunto, both those which have been discovered and those which may be discovered afterwards, in all their length and breadth, bounded on the one side by the seas of the north and of the west, and on the other by the south sea; declaring to the nations thereof that from this time forth they are vassals of his majesty, bound to obey his laws and follow his customs; promising them on his part all succor and protection against the incursions and invasions of their enemies; declaring to all other potentates, princes, sovereigns, states and republics, to them and their subjects, that they can not and are not to seize or settle upon any part of the aforesaid countries, save only under the good pleasure of his most Christian majesty, and of him who will govern in his behalf; and this on pain of incurring his resentment and the efforts of his arms. Vive le Roy!'

Nearly two centuries and a half have elapsed since the envoy of Talon took possession of Sault Ste. Marie, and nearly all the interior of this continent, in the name of Louis XIV. Although France has left her print deep in the sands of time and history, yet her dream of controlling the destinies of America did not realize. Her civilization, her literature, her language, her religion shall ever be known, and the presence of three million French Canadians scattered from one end of the continent to the other, is the living demonstration that France is immortal.

"Sir, in the struggle with nature, in the stress of commercial activity, the average man is too apt to live almost wholly in the present and to forget the debt he owes to the past. In the celebration of the event which has brought us together to-day, I thought that I should recall the proud deeds of the French pioneers.

"In September, 1759, when Wolfe and Montcalm fell on the plains of Abraham, the whole North American continent became British. The thirteen colonies soon however revolted and proclaimed their independence, thus giving birth to the American republic.

"The Dominion of Canada, although enjoying as much constitutional freedom as the United States, still remains a British possession. Our allegiance to Great Britain and her beloved King Edward VII, is the more sincere because it is based on gratitude. The mother country has, long ago, given us a constitution under which civil and religious liberty have grown and developed. We are happy under British rule, we are perfectly free. We do not look for annexation, we do not wish it. We believe that the American continent is broad enough to contain two commonwealths, the American republic and the Dominion of Canada. We wish to live in friendship and harmony side by side with our great, our colossal neighbor. Her enormous wealth has not excited our envy, but it has given in our country rise to a feeling of emulation. We wish to imitate your example and follow in your footsteps.

"Canada is entering upon a new era. Our resources are vast, in fact, inexhaustible. We can support a population of 100,000,000 souls. We have room in our Canadian west for 50,000,000. Last year, Manitoba furnished 50,000,000 bushels of No. 1 hard wheat from 2,000,000 acres of land. There are 200,000,000 more, and just as good, that have not been ploughed. I need not speak of our minerals, iron, coal, petroleum, gold and silver. If there is an authority here to speak of our Canadian resources, it is that young and energetic American born citizen, Mr. Clergue, who, on the other side of the river, is revolutionizing our industries.

"Sir, I believe that this is an occasion when one can advocate better trade relations between the two countries, arrangements on a fairer and more equitable basis which would ultimately be advantageous.

"A little after England had abrogated the corn laws, a reciprocity treaty known as the Elgin Treaty, was negotiated between the two countries. It went into effect in 1854, and remained in operation till 1866. Under that treaty, the trade between the two countries quadrupled in twelve years. That treaty was abrogated because it was said Canada had sympathized with the South during the Civil War, when as a matter of history 40,000 Canadians had served in the Union army. Vain efforts have since been made to renew a treaty and our trade has found new channels. Notwithstanding your high tariff wall, Canada has attained quite a prominent position as regards trade, amongst the nations. Last year our aggregate trade amounted to: Exports, $213,521,000; imports, $259,211,800, total $472,732,800, and there are signs to show that we have not yet reached the high water mark.

"But sir, without suggesting in the least any particular trade policy, one must not forget that you are our next neighbor, that we are one of your best customers and that the interchange of commerce between Canada and the United States should and must be put on such a basis as only befits two friendly nations.

"In conclusion, let me say that if we have an unbounded faith in our dominion, we also look with pride to the mighty achievements of the land of Washington, Jefferson, Lincoln and Roosevelt. We can not ignore your extraordinary ascendency amongst the nations of the world and I am only echoing the sentiments of six million Canadians in repeating the words of Longfellow, when in his beautiful poem 'The Building of the Ship,' comparing his native land to a vessel tossed upon the waves, he concludes with this most pathetic invocation:

Thou, too, sail on, O Ship of State!
Sail on, O Union, strong and great!
Humanity with all its fears,
With all the hopes of future years,
Is hanging breathless on thy fate!
We knew what Master laid thy keel,
What workmen wrought thy ribs of steel,
Who made each mast, and sail, and rope,
What anvils rang, what hammers beat,
In what a forge and what a heat
Are shaped the anchors of thy hope!
Fear not each sudden sound and shock,
'Tis of the wave and not the rock;
'Tis but the flapping of the sail,
And not a rent made by the gale!
In spite of rock and tempest's roar,
In spite of false lights on the shore;
Sail on, nor fear to breast the sea!
Our hearts, our hopes, our prayers, our tears,
Our faith triumphant o'er our fears,
Are all with thee, are all with thee!

The steamer Centennial left San Francisco on June 12 with a cargo of salt for the Russian port Nicolaefski. She left Dutch Harbor July 26 but has not been heard of since. It is thought that the Japanese have captured her. She was built in 1859 for the Peninsular & Oriental Steamship Co., being a side-wheeler and named Delta. During the war with China the Japanese used her as a transport, under the name Takasago Maru. She is owned by the Charles Nelson Co. of San Francisco, and is under charter to the Barneson-Hibberd Co.

The United States government will soon have another ferryboat, similar to the General McDowell, in San Francisco bay. She will reach San Francisco from Seattle in a few weeks, her name being Lieutenant George M. Harris. Application has been made for a dock for the new boat.

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DANDERLAND'S ADDRESS AT SAULT STE. MARIE

A notable address was delivered by Hon. Raoul Danderland, secretary of the Dominion senate, at Sault Ste. Marie on Aug. 3, upon the occasion of the completion of the first canal to commerce. He said:

"This commemoration allows the United States the opportunity of examining the distance traveled and the strides made by the nation as a whole and by its western states in particular. Nations, on this continent, have such a short record, comparatively, that they have not long to ponder as to what part of their existence has been most profitable and most successful. Can a nation boast of having attained its age of majority before it is one century old? The United States have not yet completed their first half of their second century. They are just out of their teens.

"One could easily see 50 years ago that the foundations had been laid for the making of a strong nation, but no one could then foresee that 50 years later this infant nation would enter the mundial political concert, claiming justly therein one of the predominant places. Whatever his imagination, whatever his enthusiasm for this land of supreme freedom and of the bountiful, no one could have predicted that in less than fifty years this country would be peopled to overflowing and would be invading with its products all the markets of the world.

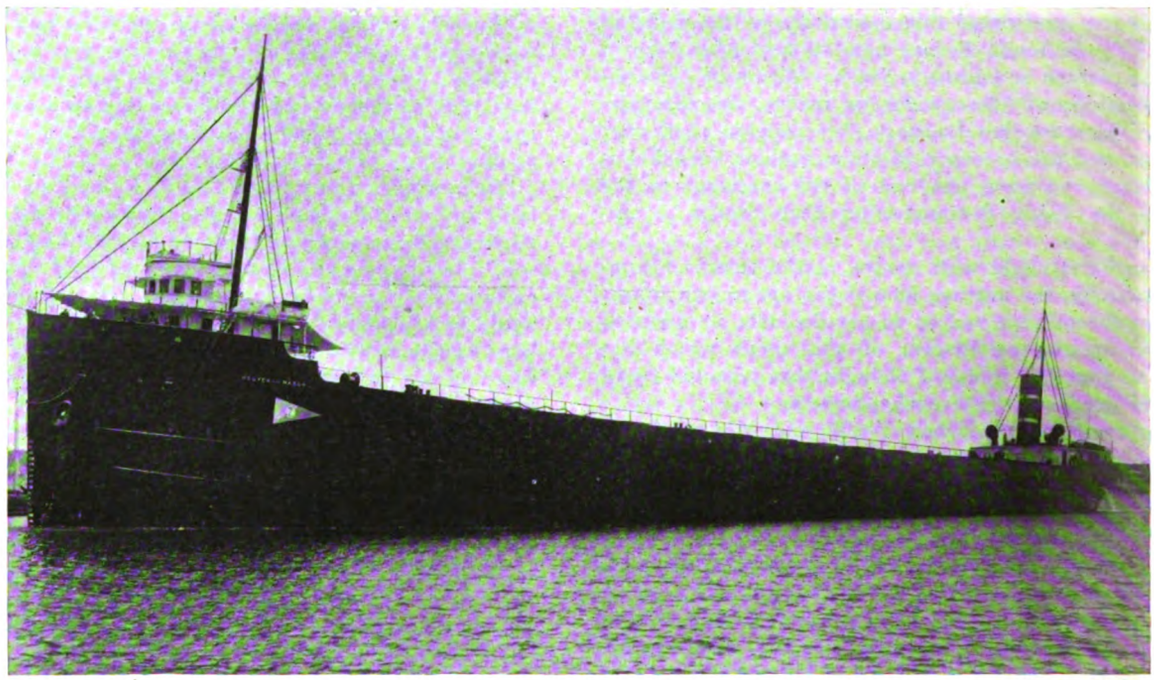
"In 1900 you were eighty millions. What tale will the next census tell? Still the Europeans keep pouring in yearly by hundreds of thousands. In their search for good arable lands, some of them even cross the imaginary line which divides us. They meet on our plains other Europeans, who came direct through our own doors, immigrants who have found out that Canada is not a distant land, far away towards the north pole, that our metropolis is but twelve hours distant from yours and, on their way to New York, that they can stop at our front door, 36 hours before their ship could bring them to the Hudson.

"Canada is now beginning to fill up. We believe that we stand to-day where you stood 40 years ago. We feel that the wave of prosperity which has covered your lands is extending its area and is beating on our shores. We hope that during the next fifty years Canada will develop strongly and healthily. We will not forget that very often, in these regions, the United States, during the last century, have led the way in the development of western commerce. We know what you have done for the betterment of navigation on the lakes and how helpful you have been to our mariners.

"You linked the upper lakes at this spot forty years before we followed suit. Our requirements were not then as pressing as yours.

"We are sanguine of being able to show as large a tonnage as your present one before very many years go by, through the rapid development of our agricultural west, of our rich mines and of our industries. We hope to be able, before another half century is completed, to reciprocate in kind by offering you a direct outlet to the sea, through a twenty-foot waterway via the Ottawa and St. Lawrence rivers, thus saving you the annoyance of twice breaking bulk before reaching a European port. When Canada will have executed the necessary works on that water route, your steamers may take their cargoes at Duluth and bring them in a straight line to Liverpool. We must do that in the interest of half a continent lying west of the lakes which needs a short, a direct and easy water route to the Atlantic. We must do it to repay our American cousins for the numerous pioneer works they have in the past executed on the lakes to our great advantage.

"The United States have reached their complete material development. Within a few decades Canada will be as fully equipped. When both sides of our great lakes are equally populated, when towns and cities dot our shores, when millions of men plow our northwestern prairies, what a sight will behold our grandchildren when they are gathered here to celebrate the centennial celebration of the joining of these two lakes! But material development cannot be the sole end of a nation. When this stage has been reached the nation must continue its march towards a higher civilization. To be one hundred millions is not synonymous to being glorious and envied.



STEAMER HOOVER & MASON OF THE TOMLINSON FLEET.

[*Built at the Ecorse yards of the Great Lakes Engineering Works.*

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Nations past and present can show a larger population without commanding admiration. Smaller ones have shed considerable lustre in the history of the world through their predominance in sciences and arts and their greater refinement. It is little to be materially great if one is not morally so.

"One need not be a prophet to predict for northern America a prodigious future. Will we not be 150 million people before this century is over?

"It behooves the statesmen of the day to set before their people a high standard of public morals so as to lift them to a higher plane. I commend and applaud the manly and elevating utterances of your president, Theodore Roosevelt, whose lofty ideals make for the betterment of humanity. There is to my mind an ideal which should be our one ideal, distinguishing specially North America from the rest of the world. Most of our fathers and ancestors have sought this land to free themselves from the various burdens that made them poor or miserable in their native country. The greatest curse from which they fled has been European militarism.

"Europe can justly boast of a higher culture in arts and sciences, of a greater accumulation of art treasures, of a larger class of men of wealth and leisure devoting themselves exclusively to refined arts and intellectual pursuits. These advantages undoubtedly make towards a higher civilization, but real progress and true civilization must be judged by a different standard.

"Since the Divine Ruler appeared on this earth to preach peace and good will among men, since He has laid down in a single phrase the guiding rule which resumes the whole Christian doctrine—Do unto others as you would have others do unto you—it must be admitted that a greater sense of justice has governed the actions of men individually. Man's conscience is no more oppressed and equality before the law is now universally proclaimed in the Christian world. More justice reigns among men. This is the only sure sign that humanity has attained greater civilization.

"Can this be said of nations in their relations between them? Decidedly not. Europe is still a military camp, where millions of men are in daily training to better kill and slaughter their fellow beings and neighbors. Taxes keep on increasing to maintain enormous armaments, till life has become a burden to a large proportion of the toilers who yearly flee to this country by hundreds of thousands. In Europe war is an element which must constantly be reckoned with. That contingency is in the trend of mind of every thinking individual.

"In defense of such a system the argument is advanced that one must protect himself against the attacks of a strong enemy, but every one of those nations will occasionally, when an easy chance presents itself for aggrandizement, declare war upon the weaker and will crush him mercilessly. In this twentieth century, Europe, as in the fifteenth century, knows but one measure of justice governing the relations of nations—the law of might. European nations, as corporate beings, are still as barbarous as 500 years ago. One will find across the Atlantic men who will commend war as a splendid sport which develops manly qualities and the highest among them—self sacrifice. It should be easy to cultivate such a virtue through less brutal and less sanguinary methods.

"A Canadian writer was lately affirming that the cardinal doctrine of North American politics should be the maintenance of peace on this continent. Within the next 50 years, I repeat, we will be one hundred and fifty millions of people, under two flags, it is true, the honored Star Spangled Banner and the Union Jack, under which we enjoy complete autonomy, but although separated as to allegiance, let us have but one aim, but one supreme ideal, the constant application of the golden rule in our national acts; let us teach Europe greater humanitarian principles.

"A distinguished statesman from abroad was lately studying our body politic and analyzing our mentality. He expressed his very great surprise that the eventuality of war never entered our mind. He was, of course, from Europe. Blessed be the country which can be in that state of mind. All our efforts should tend towards remaining so. Let us preach arbitration, day in and day out, as the solution of all our difficulties. The United States lately went to war, but it was for the purpose of putting an end to war and to bring order, freedom and peace to a neighbor. This is truly and nobly American —North American I should say.

"A colossal monument is about to be erected in the state of New York in honor of peace. I express the hope that it will be so placed as to be seen at the same time as the Statue of Liberty, so that those two monuments may proclaim at once to the world that this northern part of America guarantees forever to its inhabitants the two greatest blessings that can be given to mankind—peace and liberty."

NEED OF AMERICAN STEAMSHIP LINES

In his annual report, covering the year 1904, United States Consul Henry W. Furniss, of Bahia, Brazil, writes as follows concerning the need for an American steamship line to run between the United States and the port of Bahia:

"I have to reiterate my oft-repeated report of the need for an American steamship line. The mail service between the Unitd States and this section of Brazil during the year just past has become much worse than heretofore, due to the withdrawal of one or two monthly boats. As a result, of the cargo offering here for the United States, and the frequent call of vessels to get it, coupled with the fact that Brazil requires all steamers to take mail, there have been frequent calls of vessels to get mails from here, but there is only one regular boat bringing mails from New York. Between times, letters are sent hither from New York by various roundabout ways. This has virtually paralyzed the mail service. For this reason it is frequently the case that mail sent from New York in the middle of a month arrives here days after the mail leaving New York on the first of the ensuing month. This causes great prejudice to business, as the mails arriving last often have bills of lading and custom-house documents for goods arriving by the prior steamer, necessitating extra expense, vexatious delays, and great trouble to withdraw from the custom-house here, which seriously hurts our trade. It is impossible to maintain trade without frequent and rapid mail service. With the lack of this to contend with and the high freight charges out of New York, it is not to be wondered at that year by year our trade with this section is growing less, while the balance of trade in favor of Brazil is increasing. The present lines from New York seem to prefer high freight and little business, and make up by sending their vessels on a triangular course, viz, from Brazil to the United States, from the United States to Europe, and then from Europe, with European goods, to Brazil, with only a few vessels going and coming between Brazil and the United States direct. The German steamship lines are making preparations for an increased service with Brazil. With the aid given by these lines German trade has increased even more rapidly than ours is decreasing, and with the contemplated further increase in its fleet the outlook for German trade is even brighter than heretofore."

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Published every Thursday by

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CLEVELAND.

CHICAGO: MONADNOCK BUILDING.
PITTSBURG: PARK BUILDING.
NEW YORK: 150 NASSAU STREET.

Correspondence on Marine Engineering, Shipbuilding and Shipping Subjects Solicited.

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Subscribers can have addresses changed at will.

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The Cleveland News Co. will supply the trade with the MARINE REVIEW through the regular channels of the American News Co.

European Agents, The International News Company, Breams Building, Chancery Lane, London, E. C. England.

Entered at the Post Office at Cleveland, Ohio, as Second Class Matter.

AUGUST 24, 1905.

In a season such as this when more ore is coming down the lakes than ever before, when it is really pouring in torrents on the docks, the fact that small vessels have had to go into ordinary is most significant. It is a sign of the future. If the small vessel cannot make money now it never can. It is pretty conclusive proof that the ore trade belongs to the great carrier and that the small sized steel ship will have to find profitable employment elsewhere. The day of the excessive freight rate is gone forever. The business of the great lakes is getting to be as well regulated and scientific as the business of railroading. Rate schedules are being fixed with strict relation to the service performed. It would not be surprising if the wild rate works out this year to the precise figure of the contract rate. This has been the tendency for the past few years. There is now a total absence of the fluctuations that formerly marked the rate during the closing months of navigation. Freights close tamely nowadays.

Vesselmen are apt to complain that there is no longer money in the business. There doubtless is not for the small ship in the ore trade. But there is money in it for the great carrier even at the low rate of 75 cents. Some interesting figures, which have lately been worked out by certain vessel men, show a profit of 15 percent on an average season. These figures cannot well be disputed provided that the ship is secured at a reasonable figure.

The giant steamer is the most economical form of carrier for the ore consuming companies to own. There is talk now of putting on the lakes one greater than any now afloat—not a bad idea for an interest that is big enough to care for such a steamer; but it is open to discussion yet whether an 8,000-ton steamer, or one that might carry 8,500 tons on 19 ft. draught, is not the most economical for an independent vessel owner. In the first place it is not always possible to get full cargoes, and in that event a smaller steamer is suffering less loss. Then again it is ticklish work maneuvering a big one in some of the tortuous and crowded harbors and time and tug bills eat into profit. Capt. John Mitchell was probably wise when he followed his two orders for big steamers with an order for a smaller one.

In reviewing the lake trade it is wonderful to note with what strides it has grown. The 10,000-ton steamer is the creation of the past year. We are now accustomed to it; but less than ten years ago the average carrying capacity was between 3,000 and 4,000 tons. So fast have steamers multiplied that the orders of the past eighteen months are sufficient to have cared for the entire ore trade of the great lakes even as late as ten years ago. The ore trade must continue to grow, otherwise a great many vessels will have to be tied to the docks. But the ore trade will probably grow. New uses are being constantly found for iron and a movement of 45,000,000 tons within a few years is already predicted. In fact it is within reasonable approach now. Thirty-one million tons are coming down the lakes this year.

If a nation adopts a fixed and settled policy toward its industries it should extend the operation of that policy impartially to all, or it should alter its policy altogether. Any other course is wrong and unfair. The fiscal policy of the United States could not be changed without a great storm of protest and probably not without great injury to the welfare of the nation. Protection has done much for the United States. It may indeed be responsible for the few enormous and unweildy fortunes which are possessed by certain Americans; but it is also responsible for the wide distribution which wealth has undergone in this country and which is enjoyed by hundreds of thousands, even millions. There is no serious intention of disturbing this policy; but in common fairness it should be extended to all industries. Why should shipping have been exempted from the fold? Isn't it as plain as daylight that if you extend support to one industry you doubly handicap the one to which

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protection has not been extended? For it has to fight against the higher cost which protection involves and at the same time win a profit upon a heavier investment and against a competition which has lesser costs to meet. Ruin inevitably follows. That is the state of shipping in the United States today. It isn't fair, it isn't a square deal. For a fraction of the money that goes to the railways annually, shipping could be made a profitable industry. For a tithe of what is spent to foreign steamship lines the United States could have a magnificent fleet of its own. Why not try it? Why not pass the bill at the next session of congress which was introduced at the last session as a result of the investigations of the Merchant Marine Commission. That bill takes no money out of the treasury. It simply distributes tonnage dues among American ships that conform to certain conditions. It is a reasonable and sensible measure and should be passed.

TWO TURBINE STEAMERS

The announcement that the Metropolitan line of New York, now a branch of the Eastern Steamship Co., had awarded a contract for two mammoth turbine steamers for its service between Boston and New York has occasioned considerable interest in steamship and transportation circles throughout the East. Heretofore the line has confined its business to the freight traffic exclusively, but it now intends to make a bid for the passenger business as well.

The contract is one of the largest in the shipping line ever entered into in this country, and involves an expenditure of over $2,000,000. General Manager Calvin Austin said that the steamers would be completed and ready for service in about a year. The contract for the hulls has been awarded to the Roach's Shipyard, Chester, Pa., and William F. Fletcher & Co., of Hoboken, has the contract for the machinery, while the joiner work will be done by Charles N. Englis, of New York. Mr. Austin said that the steamers would be 400 ft. long, 51 ft. beam, with a flaring guard 6 ft. wide, making the breadth over all 63 ft. The depth of hold will be 23 ft. The introduction of turbines into the new boats is the most important feature. They will be equipped with the Parsons type of turbines, and the construction of the engines will be directly under the supervision of the inventor. Each will be driven by three turbine engines of 11,000 H. P. each. Each vessel will have three propellers making 500 revolutions a minute, driving the vessels through water at the rate of 24 miles an hour. This will enable the steamers to make the run between Boston and New York in fifteen hours, leaving here at 5 p. m. and arriving in New York at 8 the following morning.

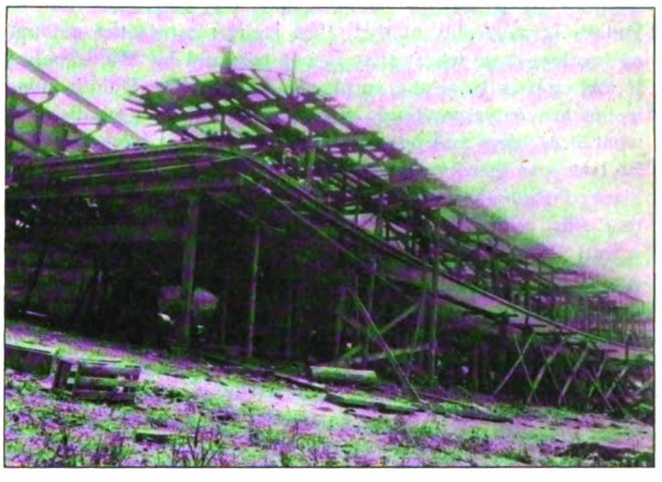
In the construction of the two steamers no expense will be spared and they will be equipped with all the most approved devices for the rapid handling of freight and for the comfort of the passengers. On the main deck there will be freight capacity for about 1,000 tons. On this deck will also be located the spacious dining-room, occupying the entire breadth of the ship and having a seating capacity of 250 persons. It will be finished in white mahogany, with large plate-glass windows on both sides, giving an unobstructed view of the ocean to the diners. The purser's office, washroom, barber shop and checkroom will also be located on the main deck, and there will be an elaborate hallway finished in red mahogany with rubber tiling floor.

Leading from the main deck to the main saloon will be a wide stairway, with artistic archings and decorations. The saloon will be a beautiful apartment, large and airy, with staterooms on both sides and convenient exits and entrances. A gallery above the saloon gives a spacious promenade upon which other staterooms open.

About midships is located the stairway leading from the gallery to the smoking room, projecting through the dome. This room will be appropriately furnished with leather furniture, and will have heavy glass windows, making it an ideal observation room. Each steamer will have 300 staterooms, furnished in the most approved style. Twenty-five of these rooms will be exceptionally large, and will have brass bedsteads, with baths attached. The steamers will have accommodations for 1,000 passengers each. The hulls will be of steel, structurally built to withstand the roughest kind of weather, and will be provided with numerous bulkheads and every known improvement to safeguard the lives of the passengers.

HENRY A. LAUGHLIN ON THE WAYS

The new steamer Henry A. Laughlin, building at the ship yard of James Rees & Sons Co., Pittsburg, for The Jones & Laughlin Steel Co., is rapidly nearing completion and will be launched into the Allegheny river in about two weeks. The new boat, which will be the first in the river coal trade



THE HENRY A. LAUGHLIN ON THE WAYS.

to have steel cabin frames, will be used between the coal mines of the Jones & Laughlin Steel Co., on pool 4, Monongahela river and the mills of the company at Pittsburg, measures 135 ft. on deck, 24 ft. beam and 4½ ft. deep, and will be equipped with tandem compound condensing engines with low pressure cylinders 24 in. and high pressure cylinders 12 in. and will develop 240 H. P. Three two-flue boilers 38 in. diameter and 28 ft. long will furnish the steam. The new boat, which in the accompanying illustration is shown on the ways at the ship yard, will go into commission in October. The Henry A. Laughlin is the fifth boat operated in its own coal trade by the Jones & Laughlin Steel Co. The other boats are Vesta and Vulcan, compound engines, and Titan and Sailor, high pressure engines.

The gasoline launch Union made her trial trip on San Francisco bay on Aug. 13, beating one of the North Shore ferry steamers by a large margin in a run of about three miles. She made a speed of 21 7-10 miles per hour. Her rudder gave way but a temporary one was contrived out of a pole and the top of a wooden box, enabling her to reach the wharf of the San Francisco Yacht Club, at Sausalito.

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ENORMOUS GRAIN CROP

Duluth, Minn., Aug. 22.—The 1905 Northwest grain crop is being harvested. Early this week the harvest became general all through the region to and north of the Canadian boundary line, and it is now in full swing. New wheat has been received at Minneapolis and new barley and oats at Duluth. The latter point cannot expect to get new wheat till next week, but in the course of a month it will be rolling into the head of the lakes at the rate of 100,000 to 150,000 bushels a day. All the railroads that serve the Northwest have been fixing up their rolling stock and equipment and have stationed their cars in long lines at hundreds of points through the grain country. They are preparing for a crop the like of which has not been seen for years, perhaps never had its equal.

On account of the fact that the crop is good not only in scattered localities, but all over the West, Chicago will have all it needs to give its speculators a chance to deal in wind wheat without coming into the Northwest for the actual stuff on which to base its trades. Minneapolis, too, which requires 60,000,000 bushels a year for her own mills and a big lot additional for shipping to interior points, will get what she wants without disturbing the more northerly territory that has been called the Duluth region. So there will be unrestricted shipments to the head of the lake from a vast region naturally tributary to it. This means a tremendous quantity of grain for Duluth and for eastern shipment. Duluth is a surplus market, that is, it receives the amount of northwestern wheat that is not required by Minneapolis; if the crop is large the surplus is big and the Duluth shipments are correspondingly great; if small Minneapolis gets what it requires and lets Duluth and the lakes have the rest. So last year there were about 52,000,000 bushels of all grains handled through the head of the lakes. Grain men predict that this year this will be nearly 100,000,000 bu. all told; wheat, flax, oats, barley, corn and rye. The flax crop is enormous and so is that of oats, while the barley business is expected to exceed all records.

Duluth is a shipping market. What stuff it gets goes east by lake, and everything that increases its business is good for the vesselman. He, therefore, is quite satisfied with the outlook. But there is little chance for a marked rise in vessel rates, the best that can be hoped is that they will hold at the figure that has been set for September shipment, that is two cents for wheat, or possibly firm up a bit. To be sure late shipments and special lots may bring more. With the increase in the grain trade and an absence of the congestion that has prevailed of late, the flour trade will take on a different aspect, and the shipments of Duluth and Minneapolis flour eastward will resume its old time prominence. It is needless to state that this year's flour trade has been very disappointing to all concerned.

Crop experts say that this country will have 100,000,000 bu. wheat for export this crop, and much of this will be from the head of the lakes. There will be less wheat to go from New Orleans than usual, even with a large crop, on account of present conditions in that city, and there is not likely to be much change in the shipments from Chicago, as its territory will be drawn on by Minneapolis.

If there is a "100,000,000-bushel crop" in the Canadian Northwest, as is claimed, or if there is a 75,000,000-bushel crop, as is more probable, the movement from Canadian Lake Superior terminals will be enormous. It will be so large as to glut the avenues of traffic eastward, not the Georgian bay and Montreal shipping routes, perhaps, for their facilities have been tremendously increased the past year, and are still growing, but those of rail lines west of Lake Superior and from Georgian bay east, and on the ocean out of Montreal. There is a record breaking crop not only in the Canadian Northwest but through Ontario, and when Ontario comes to the front it does not take long in the fall to fill up all the ocean room available from Montreal. Ontario's crop, too, will give the roads west from Lake Ontario all they care to do for a long time. The rail haul on grain from the Canadian Northwest to Lake Superior is not similar to that on grain from the Red river valley to Duluth, it is three or four times as long. There are fewer lines and they are less able to handle the business. Though they have done wonders in the past two or three years in providing terminal facilities, intermediate storage, cars and motive power, they are not equipped for moving the enormous volume of traffic that flows to Duluth and Minneapolis over American roads. All this means that a large volume of Canadian wheat will seek the sea via Buffalo, and possibly that some of it will reach Lake Superior via Duluth, in bond of course, for the statesmen of our country have not reached that point where they can see more than two weeks beyond the nearest election.

By Sept. 15 the grain crop will be moving freely from the Northwest, and the 34,000,000-bushel elevator capacity at Duluth and the 18,000,000-bushel capacity at Canadian Lake Superior ports, will be active.

During the past few years attempts have been made at various times by people in the city of Superior, Wis., to inject themselves into the grain trade and to share in the business of the Duluth Board of Trade. The most ambitious of these efforts was this year, and great were the anticipations. But it is all over except the funeral, and it is safe to say that no future effort will be made. The grain trade of the head of the lakes will remain just where it has always been and there will be no more efforts to dislodge it. Up to the present there have been a few grain men doing business at Superior, but their occupation is now gone.

GERMAN SHIPS HOLD SOUTH AMERICAN TRADE

Editor Marine Review:—Germany's flourishing export trade to South America is mainly due to direct and prompt transportation service. The Empire has forty-three large steamships in her South American service, and six more are nearly ready for launching. The forty-nine ships aggregate 217,915 gross tons. They ply on four routes, all starting from Hamburg, connecting that port with the La Plata States and Brazil. In this connection an American merchant living in Buenos Ayres, writes to an English paper: "Owing to the want of parcel-post connection with the United States, my firm is obliged to order every year many thousand dollars' worth of goods in Europe, which I would prefer to get from home. We even have no regular mail service with the United states. Replies from there take three months to reach us here, whereas letters from Europe reach us in two weeks. American steamers (or steamers of several nations) carrying goods from America, always have petroleum in their cargo and therefore are not allowed to enter the inner harbor. They have to anchor outside and discharge by lighters, a slow process. European cargoes can be disposed of in five days, while goods from New York require four weeks after arrival, before we can sell the goods. That this condition handicaps trade with the United States needs no further demonstration."

And the gentleman writing from Buenos Ayres is right.

WALTER J. BALLARD.

Schenectady, N. Y.

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STATISTICS OF VESSELS LOST

Liverpool, Aug. 14.—While various British shipping and commercial bodies have expressed their strong desire that Great Britain should be represented at the diplomatic conference to be held at Brussels next month to advocate a uniform international law with regard to salvage and collissions at sea, it is interesting to note that one important body has held aloof. This is the committee of the Liverpool Underwriters' Association. Hitherto the association has not officially taken part in any of the conferences of the International Maritime Committee for the reason that it was not satisfied that simple unification would put an end to the anomalies and inconveniences which exist in maritime law, and it is understood that that is the position which the committee still adopts in regard to the forthcoming Brussels conference. Up to the present the British Government has come to no decision in the matter.

The commerce of the United Kingdom as revealed in the Board of Trade returns for July affords scope for pleasant comment in certain respects. It is gratifying to note that during the month exports and imports were considerably greater than in the corresponding period of last year, and that the seven months' trade (January-July) shows an increase of over 14½ million pounds sterling in exports, and nearly 5 millions in imports. On the import side the main features of increase are found in grain and flour, and in unmanufactured goods in cotton, while in manufactured goods the development consists rather in a substantial general growth all round than of a striking boom in any one particular branch. The wheat imports for July are remarkable, seeing that Canada and the United States sent us a considerably decreased supply, while Australia trebled her July figure of 1904, Russia, Argentine, and the British East Indies almost doubled their contribution. The exports call for little comment. In no one section of trade has there been any such development as to show out in relief against the returns from others. This fact, however, only the more strongly emphasizes the fully satisfactory condition of the export trade as showing a healthy all-round growth.

The statistical summary of vessels totally lost, condemned, etc., now published by Lloyd's Register, shows that during 1904 the gross reduction in the effective mercantile marine of the world amounted to 807 vessels of 738,145 tons, excluding all vessels of less than 100 tons. Of this total 344 vessels of 512,879 tons were steamers, and 463 of 225,266 tons were sailing vessels. The figures for the previous ten years are as follows:

	Steamers.		Sailing Vessels.	
Year.	No.	Gross Tons.	No.	Gross Tons.
1894	281	329,929	873	379,042
1895	310	372,463	927	433,815
1896	270	361,442	781	376,337
1897	293	398,207	752	328,593
1898	322	463,241	819	357,484
1899	330	469,621	666	313,887
1900	296	386,304	552	290,878
1901	268	366,584	538	295,984
1902	301	408,363	571	292,327
1903	326	479,081	596	300,722

If a percentage is taken of the total vessels owned as recorded in Lloyd's Register Book, it will be seen that the losses of sailing vessels show a steady reduction. The percentage of steamers lost during the years 1899-1903 inclusive showed a reduction as compared with the previous quinquennial period. The figures for the year 1904 show a slight increase on the previous averages, which is accounted for by the large number of Japanese and Russian steamers which have been lost or destroyed during the progress of the war. The figures which are given above include all removals from the register whether by wreck, sale or otherwise. During 1904 the steam and sailing vessels lost, condemned, etc., as the result of wreck, collision, or other casualty numbered 646 of 604,608 gross tons. Dealing first with steamers, the total was 280 vessels of 424,175 tons, and included 98 vessels of 166,826 tons owned in the United Kingdom, and 14 vessels of 5,783 tons owned in the colonies, the other chief countries being represented as under: Japan, 34 vessels of 69,718 tons; Germany, 21 of 42,446 tons; Russia, 17 of 21,015 tons; United States (exclusive of lake tonnage), 16 of 15,671 tons, and Norway, 13 of 12,954 tons. There were 366 sailing vessels of 180,493 in this list, and these included: United Kingdom, 40 vessels of 32,669 tons; colonies, 57 of 27,283 tons; United States, 94 of 38,413 tons (excluding vessels on the great lakes); Norway, 47 of 30,323 tons; Sweden, 26 of 6,229 tons; Italy, 27 of 12,268 tons; France, 22 of 13,631 tons, and Russia, 20 of 6,611 tons. The summary exhibits interesting data as to the relative frequency of the different kinds of casualty, etc., which conclude the existence of vessels. Strandings and kindred casualties which are comprised under the term "wrecked" are much the most prolific cause of disaster. To such casualties are attributable 43.3 percent of the losses of sailing vessels. The next most common termination of a vessel's career, excluding losses due to the Russo-Japanese war, is by condemnation, breaking up, etc.; 18.6 percent of the steamers and 24.6 of the sailing vessels removed from the merchant fleets of the world being accounted for in this manner. Of the remaining causes of loss, collision is the most general for steamers (10.8 percent); while for sailing vessels, cases of abandonment at sea come next in order of frequency (10.2 percent). The percentages just given are based on the present return alone, but the order of frequency of the several classes of casualty appear to be normal. Cases of abandoned, foundered, and missing vessels are no doubt frequently more or less similar in the circumsances of loss. If these be taken collectively, they comprehend 11.3 percent of the steamers, and 21.6 percent of the sailing vessels removed from the mercantile marine during 1904. The return has been compiled by Lloyd's Register in such a manner as to enable a comparison to be made between the percentages of loss suffered by each of the principal merchant navies in the world. Great as the absolute annual loss of vessels belonging to Britain appears to be, it is seen to form a very moderate percentage of the mercantile marine of the country, and to compare favorably with the average of the losses sustained by other leading maritime countries. The merchant navies which exceed a total of 1,000,000 tons are those of Britain, the British colonies, the United States of America, France, Germany, Italy and Norway. The percentage of steamers lost by Britain during 1904 is 1.27; while the average percentage of the other six countries is 1.66; as regards sailing vessels the percentages are 2.60 for Britain, and 3.81 for the other six countries. These figures show that steamers have a much greater immunity from disaster than have sailing vessels. The average of the yearly percentages of losses during the four years 1901-1904 for vessels owned in Britain is 1.59 percent, as compared with 3.02 percent for vessels owned by the other six countries together. These percentages are for vessels actually lost, and exclude all cases of breaking up, condemnation, etc., not known to be consequent upon casualty or stress of weather. Apart from questions of navigation, it is no doubt the cases of abandoned, foundered, and missing vessels which afford most scope for investigation and conjecture as to whether the ultimate causes of loss were unavoidable. As regards vessels owned in Britain it is satisfactory to observe that the number of casualties comprised in these classes in the present return,

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viz., twenty-seven is the lowest recorded during the fourteen years for which these wreck statistics have been compiled by Lloyd's Register.

The British Government authorities are about to make some exhaustive trials of the system of signaling by bells under water which has been developed by the Submarine Signaling Co., of Boston, U. S. A. This invention has been used experimentally by the United States Lighthouse Board at several of its stations during the past few years. It has also been adopted by the Canadian Government as an aid to navigation in the St. Lawrence. For the purpose of the British trials the North Goodwin light vessel has been fitted with a submarine bell, and the Trinity House steamship Irene with the necessary sound-receiving apparatus. The trials are being witnessed by the Trinity House authorities, accompanied by Mr. Millett, the representative of the Boston company in Britain, and other gentlemen interested in the system, including representatives of the British admiralty, the Irish Lights Commissioners, the Mersey Docks & Harbor Board, etc.

Dover is coming to the front as a port of call and will prove in the near future a serious rival to Southampton. Sir Edgar Pemberton, addressing the shareholders of the London, Chatham & Dover railway the other day said the passenger traffic at Dover began in July, 1904, with the Hamburg-American line, and now no fewer than four other lines are regularly calling there, in addition to other liners which make casual calls. The steady growth of passenger business led him to the conclusion that great developments might be expected with reference to the trans-Atlantic traffic in the immediate future. The harbor board has further been approached by representatives of several of the large lines of steamers at present carrying the traffic between Britain and America and also the East with reference to making Dover a port of call, and arrangements with some of them are expected to be completed shortly. Before the harbor was thus used one of the great experts connected with a large American line of steamers stated that in his opinion the harbor board might reasonably expect at least 400,000 passengers to embark and disembark at Dover for America alone during the year, and in this opinion he had been more than supported by Mr. Ballin, the managing director of the Hamburg-American line. It is the opinion of the harbor board that this estimate will be greatly exceeded, and that it is impossible to say to what dimensions the traffic may be developed. The geographical position of Dover is absolutely unique. It is actually three-quarters of a mile nearer Boulogne than is Falkstone, twenty-six miles nearer Flushing than is Queenborough, four miles nearer the Hook of Holland than is Harwick, and it is only about four miles further distant from Dieppe than is Newhaven. In addition it is on the high road of the traffic between the East and the West, the great ocean liners passing to and from about two or three miles off the harbor. In the voyage from Germany or Antwerp to New York 120 miles is saved on each voyage as compared with a call at Southampton. It is being urged that the Dover harbor authority should be prepared for this increased traffic by improving the accommodation both for the ocean-going steamers and for their own continental boats.

A new Atlantic passenger and cargo service conducted by the Compagne Generale Transatlantique will commence towards the end of September between ports in France. Spain, Cuba, Mexico and the United States. Three new steamers of 9,000 tons gross, namely, California, Louisiana and Mexico, will conduct the service, and they will sail from Havre and Bordeaux in France, and Vigo in Spain to Havana, Progresso, Vera Cruz, Tampico, and New Orleans. The first sailing will be from Havre on Sept. 26, and from Bordeaux on Sept. 29, and thereafter monthly.

The directors of the International Mercantile Marine Co. have re-elected for the ensuing year all the officers of the company. Mr. J. Bruce Ismay remains president, with Sir Clinton Dawkins, chairman of the committee of directors in Great Britain, Messrs. P. A. S. Franklin and John Lee, both of whom make their headquarters in New York, were re-elected vice presidents. Mr. Clement A. Griscom was again made the chairman of the board of directors, and Mr. E. E. Harvin secretary.

The half-yearly report of the Manchester Ship Canal Co. just issued, shows that there has been an increase of 116,000 tons in the weight of sea-borne merchandise, and $50,985 in the receipts as compared with the first half of last year. This result is the more encouraging because the half-year did not begin well. The January and February receipts fall off to the extent of $16,900, but after that the trade turned, the deficit was rubbed off, and the present position was reached. The Bridgewater canal department's traffic and receipts were favorably affected by the renewed activity in the cotton trade. The total profit earned was $514,980, which was available for distribution. Nine fully-laden ships had already used the new dock opened by King Edward on July 13, and the additional accommodation provided will prove a great convenience to this up-to-date port. So far this season 720,000 bales of cotton have been shipped from America and Egypt to Manchester, as against 511,000 bales during the same period last year. Other trades were gradually being built up, and the management appears satisfied that steady progress will continue to be made.

SCHOONER YACHT HOOSIER SOLD

Mr. Edgar Harding, Boston, has sold his schooner yacht Hoosier to Mr. Albert J. Morgan, Larchmont, N. Y., through the office of Stanley M. Seaman, 220 Broadway, New York. She was built in 1902 for Col. R. W. Nelson, of Kansas City, at Gloucester, from the moulds of the Gloucester fishing schooner Fredonia, designed by the late Edward Burgess, her length being increased 7 ft. She is a sea-going yacht of wood construction, carrying 90 tons of inside ballast. Her quarters are very commodious giving five large state rooms and a saloon beautifully finished in hand-carved mahogany. Her dimensions are: 125 ft. over all, 105 ft. water line, 25 ft. beam, 12.5 ft. draught. She has cruised successfully to the West Indies and Nova Scotia. A prominent New York yachtsman used every effort to charter her early in the spring from Mr. Harding to put her into the ocean race for the Kaiser's cup, but without success. She is now at Larchmont fitting out under the personal supervision of Mr. Morgan for a cruise to Mahoney Bay, Nova Scotia.

The same agency has also sold the auxiliary yawl Vidofner for C. A. Welch, Jr., Boston, to Mr. Wm. G. Wood, of New York. She is a flush deck keel boat 53 over all, 35 water line, 12.3 ft. beam, 7 ft, draught, designed and built in 1896 by Lawley. She is now being used in the vicinity of Larchmont.

The Pacific Mail Steamship Co.'s steamer Siberia with President E. H. Herriman and General Manager Schwerin on board, made a record trip from San Francisco to Honolulu in four days, 19 hours and 20 minutes, or at the rate of 18.1 knots an hour for the entire distance. An extra quantity of selected coal and an additional force of stokers were aboard for the occasion. The best previous time on the route was made by the Siberia's sister ship Korea, four days and 23 hours, two years ago.

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FREIGHT RATES ON RAILROADS

Washington, Aug. 21.—A statistician in one of the departments has prepared some interesting figures on the rates charged by railoads for the transportation of articles in general use by the great mass of consumers in this country. The railroads have seized upon them as bearing directly upon the proposed rate legislation, and are using them as an argument that a reduction in rates will not be of any particular benefit to the man who buys for his own consumption.

An examination of the results shows that the rate from New York to Chicago, approximately 950 miles, is 75 cents per hundred pounds on first-class articles, which embrace shoes, hats, clothing, etc. Sugar and coffee are carried at a cheaper rate, the cost per pound of sugar being two and one half mills, and coffee the same. These figures are not imposing and the railroad man insists that even if these articles were carried free, the cost per pound to the consumer will not be reduced, as the saving would be absorbed by the jobber and the retailer.

The table, which follows, is very interesting in showing the rates on different articles and the increase in price, irrespective of the freight rate, which does not seem to fluctuate with wholesale selling price. Before the consumer gets the things he needs, he must pay the retailer his profit.

	1,000 Mile Freight Rate Chicago to New York Base.		Average Wholesale Prices.	
	1897.	1905.	1897.	1905.
Wheat per bushel	$0.1275	$0.114	$0.7437	$1.08
Corn per bushel	0.119	0.1064	0.2875	0.575
Oats per bushel	0.068	0.068	0.22	0.345
Flour per barrel	0.27	0.30	2.90	4.00
Mess pork per barrel	1.05	1.05	8.25	13.37
Live beef per cwt	0.28	0.28	4.50	5.04
Live sheep per cwt	0.30	0.30	3.65	4.87
Bacon per cwt	0.30	0.30	4.50	7.12
Lard per cwt	0.30	0.30	4.30	7.40
Butter per pound	0.0065	0.0065	0.14	0.21
Cheese per pound	0.005	0.005	0.08	0.095
Eggs per dozen	0.014	0.014	0.115	0.20
Beans per bushel	0.16	0.16	0.90	2.10
Apples per barrel	0.67	0.67	1.00	2.50
Sugar per pound	0.0025	0.003	0.03	0.0375
Coffee per pound	0.0025	0.003	0.0737	0.085
Tea per pound	0.0075	0.0075	0.215	0.225
Hay per cwt	0.25	0.30	0.50	0.675
Kerosene oil per gallon	0.02	0.02	0.06	0.069
Cotton per pound	0.0035	0.0035	0.07875	0.0875
Wool per pound	0.0065	0.0065	0.1575	0.2609
Cotton goods per yard	0.0069	0.0069	0.065	0.0787
Woolen goods per yard	0.0092	0.0092	0.6375	0.91
Men's shoes per pair	0.0112	0.0112	*4.00	*3.50
Ladies' shoes per pair	0.01	0.01	*3.50	*3.00
Hats, derby	0.0025	0.0025	*3.50	*3.00
Straw hats	0.0025	0.0025	2.00	1.50
Nails per cwt	0.30	0.275	1.25	1.80
Turpentine per gallon	0.039	0.039	0.295	0.775
Potatoes per bushel	0.18	0.18	1.25	1.00

*Retail prices.

Although the full rate for nearly a thousand miles is given in the table, statistics show that the average haul of a ton of freight on a railroad is about 200 miles, so that the transportation charge on the bulk of things most used would, at the best, be less than 30 percent of the above.

The cost of freight charges is included in the wholesale price quoted. The price of commodities have advanced in the period of eight years shown, 36.3 percent. This covers a period of the most phenomenal prosperity in our nation's history.

The freight charges given represent the cost of the haul between Chicago and New York, approximately 1,000 miles, these being used as they are the basis upon which all freight rates, either east or west, are made. The cost of the freight haul between Chicago and Philadelphia, 100 miles less in distance, is approximately 2½ percent less than the figures given. Between Chicago and Boston, a distance greater by 217 miles, freight would add approximately 9 2-3 percent to the prices given. Between Chicago and Buffalo (590 miles less), or Pittsburg (570 miles less) the cost of freightage is approximately 40 percent less than the figures given, and between Chicago and Cleveland (450 miles) it is approximately 42 percent less. The wholesale prices at all of these points are practically the same, the variation where there is any, being in a small fraction of a cent.

Freight rates between New York and East St. Louis and other Mississippi River common points are practically 15 percent in excess of those given; to Kansas City, Omaha or other Missouri River points, they increase about 98 percent over the Chicago basis; to Denver, the freght charge increases 242 percent and to Pacific Coast points 300 percent.

So trifling are these inceases as applied to the commodities in daily use, that the retail price of all commodities whether on the Pacific coast, in the interior or on the Atlantic coast, are practically identical. A suit of clothes, hat, dress pattern, pair of shoes, pound of coffee or tea, box of cigars or bag of flour costs no more in San Francisco, Seattle or Houston than in Savanah, Boston, New York or Philadelphia.

PERSONAL

M. C. Furstenau, who was associated with Melville & McAlpine, consulting engineers and architects, 1615 Walnut street, Philadelphia, is at present in the great lakes region. Mr. Furstenau reports that his firm besides having two ice crushing steamers for service on the Delaware in hand is also designing a steamer for the coasting trade.

OBITUARY

Capt. Daniel Davis, for thirty years a captain in the lake trade, died last week at Cleveland. The last vessel of which Capt. Davis had charge was the barge Mentor, owned by the Hunking Bros. Construction Co.

Capt. Charles Hilliard, one of the best known steamboat men on the Atlantic coast, died at his home in Eastport, Me., last week of paralysis. He was in the employ of the International Steamship Co. for many years.

Capt. Jerome B. Osier, believed to have been the oldest resident of Illinois, died in Chicago last week at the age of 105 years. He was born at Erie, Pa., and in his younger days was master of a small schooner trading to Chicago. In 1861 he enlisted in the navy and was assigned to the Mississippi service. At the close of the war he became a life insurance agent.

George C. Rumbold, who superintended the construction of the steamer Great Eastern, which laid the first Atlantic cable, died at his home at East Orange, N. J., Sunday, Aug. 20. He was born in London eighty-two years ago and superintended the building of many ships for the British navy. He came to the United States in 1868 and retired fifteen years ago.

Andrew Fletcher, of the firm of W. & A. Fletcher Co., died at his country home at Bernardsville, N. J., on Tuesday of last week. Mr. Fletcher was known throughout the country as a builder of fast steamboats. In 1853 he founded the firm of Fletcher, Harrison & Co., in New York. In 1881 the firm became the W. & A. Fletcher Co. and in 1899 moved to Hoboken. The firm's first steamboat with a reputation for speed was the Mary Powell, which was launched in 1861. The company also built the Albany and the New York for the Albany line, as well as the Priscilla and Puritan. Mr. Fletcher was born in Scotland and was seventy-seven years old at the time of his death.

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LAKE UNDERWRITERS

Buffalo, Aug. 22.—Some months ago I had occasion to note that there was a possibility of a war between the home and foreign underwriters over lake insurance. It now looks very much like a certainty. How it will come out is a matter of no great concern to the insured, for the first thing done of course will be a general breaking of rates, with the insured getting all the benefit so long as the war lasts. After it is over somebody will resume something like the old rates and there will be stability again. It is too bad that such things cannot be adjusted without the waste of incomes and the slaughtering of interests that always accompany commercial wars, but the world, from the human race down to the lowest order of creatures, seems built on war principles, so that business wars may possibly be blessings in disguise, as they take the place of the old-fashioned wars on life itself.

The difficulty with lake underwriting is that the American companies want it all to themselves. In former years it was found impossible to interest American capital in the business to an extent sufficient to cover it. Single risks were then much smaller than they are now, but there were such small earnings that one after another of the insurance companies that had been in the business either pulled out or so limited their takings that it was necessary to obtain aid from outside. So the lake underwriters turned to the London Lloyds for relief and that aggregation was, as usual, found ready to write risks to practically any extent.

The arrangement worked well so long as the Lloyds were really needed, but it after awhile was found that more home capital could be induced to enter the business and then there was raised the question as to leadership and general policy. The methods of the Lloyds is essentially different from those of our underwriters and when they set up a standard it was hard to adjust ourselves to it. Some seasons the spring organization of the lake underwriters, especially on hulls, was held off a distressingly long time because London either insisted on changes as to tonnage valuations or constructive total-loss ratios or possibly there was no expression of wishes at all, which was just as great a cause of delay. It was then felt that London was needed and must be allowed to have her way on that account.

Since it has come about in late years that we do not need London at all there has apparently been a general casting about for a good chance to drop her off, but as she was practically all powerful in such matters the home companies did not care to precipitate a war. It appears now that our companies have fortified themselves considerably of late, while the London underwriters have their hands full with the Eastern war and are less lkely to enter on a war here than ever before. Their losses are very heavy as it is and it will be some time before they will care to enter on a new career of certain loss.

Still it may happen that the Lloyds will manage to stay in the lake business in some way till their Eastern troubles are over and then they will be more able to take care of this end of it. From the standpoint of the insured it is apparent that there is not only money in the business, but that there is expected to be money in it right along. There used to be a great amount of complaint of no profit all along the line, but the advent of the steel hull, while it did not reduce the losses as it was expected to, has so cut down the number of total losses that it has made a decided difference in the condition of affairs. What wooden hulls there are left will go in a short time and then the element of uncertainty will be much less than it has ever been.

As to the run of insurance business this season the complaints heard so generally during the first month of navigation are heard no longer, an indication that the underwriters are much better satisfied than they were. If the fall is not too severe there will be at least profit enough to encourage the companies to go on, war or no war. The light earnings in cargo insurance continue. There is so little flour or grain moving that this alone would reduce the income materially. Besides the lumber movement is light and there has not for a long time been much in the coal insurance business, so that it is left dependent on iron ore, which largely goes without insurance.

Underwriters are looking, though, for a fall business in grain and there are plenty of indications that they are right. One day last week New York reported a big stir in export grain, and if our prices are now down to an export basis as they seem to be there will be something nice in lake grain yet, both for the carrier and the underwriter.

JOHN CHAMBERLIN.

The following table shows the principal imports to Manchester by way of the canal in every completed year since its opening and up to the end of 1904:

Description of Imports.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
Cotton	Tons. 25,518	Tons 67,915	Tons. 78,785	Tons. 102,832	Tons. 100,880	Tons. 147,027	Tons. 130,743	Tons 140,132	Tons 153,557	Tons. 141,733
Grain	35,688	75,170	86,926	130,741	146,345	219,755	214,528	285,594	377,944	329,941
Timber	93,810	180,394	223,147	212,906	287,959	296,981	269,074	327,834	330,778	353,280
Paper materials	79,226	95,758	113,400	119,815	118,565	163,783	135,708	163,441	162,951	166,533
Iron ore and pyrites	21,614	44,147	38,049	36,080	39,025	33,949	29,631	40,295	66,775	63,098
Pig lead, spelter, &c.	—	8,302	13,363	21,606	38,318	28,316	38,905	42,407	42,412	44,857
Oil (in casks)	8,155	17,241	19,772	22,856	27,534	25,546	30,144	34,237	38,670	31,538
Oil (in bulk)	—	—	21,649	57,212	89,668	100,986	80,899	79,744	117,285	119,465
Green fruit	33,061	27,096	28,595	21,117	24,666	28,669	31,369	46,935	56,148	65,309
Flour, meal, farina, &c.	—	31,740	37,570	84,389	87,691	89,160	48,785	55,318	48,541	44,432
Food stuffs	—	13,619	16,195	19,260	24,412	22,280	25,065	31,440	35,389	44,940
Sugar	17,664	28,094	32,021	35,574	37,818	40,522	42,451	85,401	40,724	58,372
Live animals	—	—	Head. 38,749	Head. 38,739	Head. 81,220	Head 96,659	Head. 91,293	Head. 105,145	Head 105,075	Head. 104,590

There is little rest for the many vessels now engaged on the Pacific coast in carrying fuel oil. Depots for supplying oil to ships are now maintained just as coaling stations were formerly. Liquid fuel is much used on the plantations in the Hawaiian islands and a large depot is maintained at Honolulu. Most of the steamers in commission on the Yukon river burn California oil. The steamer Rosecrans recently towed the oil-carrying schooner Monterey to Nome and is now on a second trip to that port, towing the same schooner filled with oil from the tanks at Monterey, Cal. The trip from Monterey to Nome occupies about sixteen days. On arriving there, the oil is put into small tanks, from which the river steamers draw their supply.

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MEXICAN GUNBOATS BRAVO AND MORALES

Messrs. Odero recently completed at the yard of Sestri Ponente, near Genoa, the gunboats Bravo and Morales for the Mexican government.

The general dimensions are as follows: Length, 250 ft.; beam, 34 ft.; depth, 16 ft.; displacement, 1,280 tons; designed speed, 17 knots. The vessels are very light draught, for navigating the shallow rivers of the Mexican coast, while at the same time the bunker capacity is sufficient to carry the vessels 5,000 miles at a speed of 10 knots.

The propelling machinery consists of two sets of three-cylinder, direct-acting, triple-expansion engines of 2,600 I. H. P. Steam is supplied by two Blechynden water-tube boilers. The principal data of motive engines and boilers are the following:

Cylinders, diameter	15¾, 24⅜ and 37¾ in.
Common stroke	19⅝ in.
Revolutions	265.
I. H. P.	2,600.
Piston rod, diameter	3⅜ in.
Length of connecting rod, center to center	44¼ in.
Crank shafts, diameter	6½ in.
Crank pins, diameter	7⅛ in.
Propeller shaft, diameter	7 in.
Number of thrust collars	7.
Rubbing surface	2 sq. ft.

Air pump—Edwards type:

Diameter	13¾ in.
Stroke	10 in.
Diameter centrifugal pump runner	15¾ in.
Steam engine for centrifugal pump	4 5-16 by 4 in.

Condenser of steel sheets:

Cooling surface for one condenser	1,362 sq. ft.
No. of tubes for one condenser	1,436.
Outside tube diameter	14 milimeters.
Inside tube diameter	12.4 milimeters.

Propellers—three-bladed of manganeze bronze:

Diameter	8 ft. and 2 in.
Pitch	7 ft. and 4½ in.
Projected area	16 sq. ft.

Boilers—number, two; Blechynden's type:

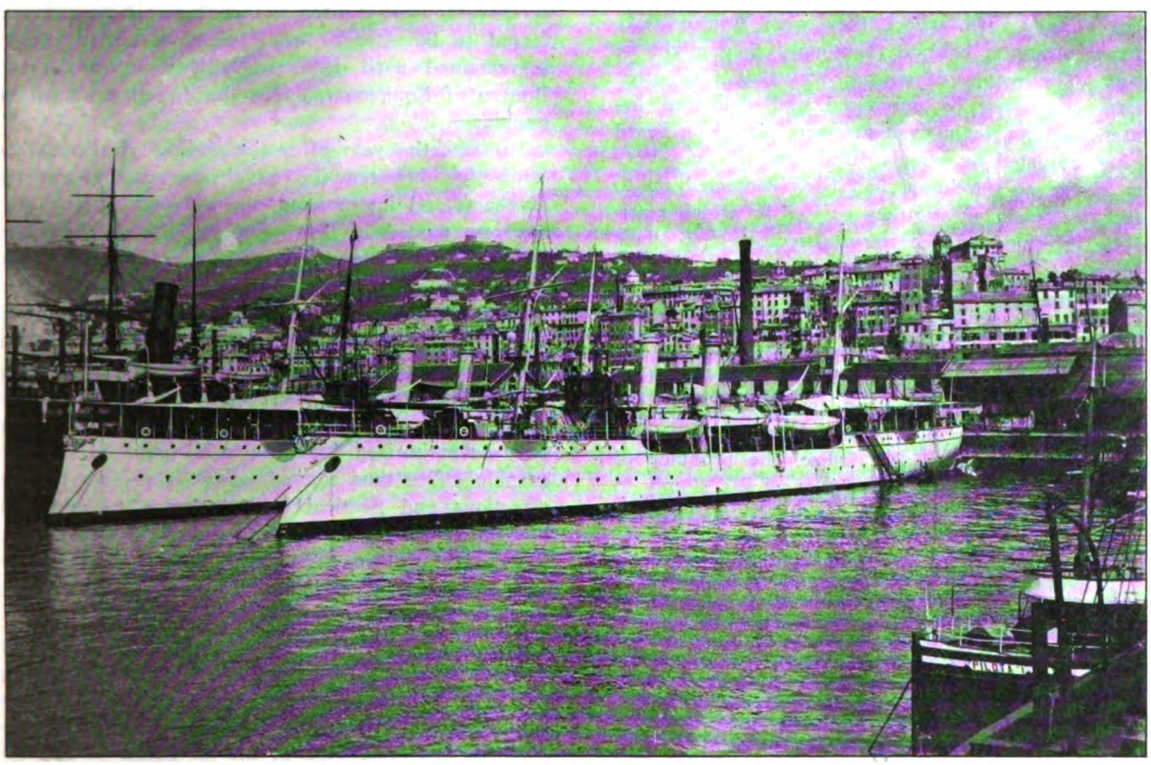
Length	11 ft. and 8 in.
Width	7 ft. and 2 in.

Furnaces—one for each boiler:

Grate surface for one boiler	59 sq. ft.
Heating surface for one boiler	2,960 sq. ft.
Working pressure	230 lbs.

There are two 4-in. rapid-fire guns of Bethlehem make, which fire directly ahead and astern respectively, and have a total arc of fire of 150 degrees; four 2¼ in. rapid-fire guns of Schacidercant type are fitted on broadside and one on the bridge. The 4-in. guns are supplied with ammunition by hoists, capable of delivering twenty-four charges per minute. Electrical hoists are provided for the other guns also. The crew will be composed of twenty-six officers and 90 men, and in addition quarters are provided on board for about 270 troops.

There are six boats, two of which are steam launches, for quickly disembarking the troops. Fresh air is supplied to the quarters by electric fans, and a large refrigerating plant is installed. In the trial trip of the Bravo as of the Morales, the results were from every point of view, thoroughly successful.



MEXICAN GUNBOATS BRAVO AND MORALES.

The enlisting officers of the United States receiving ship Independence, stationed at the Mare Island navy yard, California, sent sixteen Chinese cooks and mess attendants to serve on board the yacht Mayflower during the peace conference between the representatives of Russia and Japan. This was done at the request of the President, the Chinese being wanted to take the places of negroes, who talk too much, and of Japanese, who see too much. After the conference is over, the Chinese will be sent back to California or distributed among the ships of the North Atlantic squadron,

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THE WORK OF THE HYDROGRAPHIC OFFICE

Prior to 1830, whenever a naval vessel was in need of charts or nautical instruments, it was the custom for the commanding officer to forward to the Board of Navy Commissioners a requisition for such of these articles as he deemed necessary. This requisition, when approved by the board, was sent to the navy agent at the port where the vessel was fitting out, who filled it as far as possible by purchase from foreign governments or from the few private dealers in this country. These purchases were afterwards supplemented during the vessel's cruise by such additions as were from time to time deemed advisable by the commanding officer; and at the end of the cruise, when the vessel was put out of commission, her charts and instruments were turned in at a navy yard, where they were stowed away and no further attention paid to them until they might be needed again. The result, of course, was that very often needed charts could not be purchased and delivered before the date of sailing, or instruments were placed on board without being adjusted or standardized; and it was very seldom that charts so purchased had been corrected up to date. In fact, no official means then existed by which mariners could be informed of necessary corrections to their outfits of charts.

To obviate as far as possible the dangers to navigation resulting from such a lack of system and care, the secretary of the navy in 1830, upon the recommendation from the Board of Navy Commissioners, directed the establishment of a depot of charts and instruments under the charge of the late Commodore Goldsborough, then a lieutenant. This was the inception of the Hydrographic Office, the province of which for the first five years of its existence was simply to purchase, correct, and keep on hand charts and instruments for our naval vessels only.

It was not until 1835 that any effort was made to construct our own charts. In that year a lithographic press was purchased, and in the following year the first charts actually executed by the depot appeared for issue to the service and merchant marine.

In 1842, the bureau system of the Navy Department was established by act of congress, the depot of charts and instruments being attached to the Bureau of Ordnance and Hydrography, to constitute the hydrographic branch of that bureau.

Lieut. Maury had, in the meantime, been detailed to duty in this depot of charts and instruments, and in 1844, upon the completion of the naval observatory building (which was afterward frequently officially designated as the naval observatory and hydrographic office, the depot of charts and instruments was moved into that building, Lieut. Maury becoming the superintendent of the Naval Observatory and Hydrographic Office.

Lieut. Maury devoted the greater part of his energies to hydrographic subjects, and for the seventeen years during which he had charge of the office did more in the interests of the merchant marine than was accomplished by similar branches of all foreign governments combined. He began the collection of information from the logs of men-of-war and merchant vessels, for the purpose of constructing nautical charts to show the prevailing winds and currents, their limits and characteristics, and, in general, the physical features of the ocean and all facts of interest or value to the maritime community. This was continued during the seventeen years he remained in charge, and resulted in the issue of wind and current charts, track charts, trade-wind charts, whale feeding ground charts, thermal charts, storm and rain charts, and eight large volumes of sailing directions, all of which were concerned with the safe navigation of the known waters of the globe. In addition, there were issued nearly fifty charts of different sections of the world, which were printed from engraved copperplates.

On the breaking out of the civil war, Maury cast his fortunes with the South and his practical labors for the navy and merchant marine ceased. He was succeeded by one of the most accomplished officers in the service, the then Commander Gillis and the Hydrographic Office during the four years of the civil war gained an excellent reputation in and out of the service through its ability to keep our war vessels supplied with the latest charts, nautical publications and other necessary aids to safe navigation.

The work of the office was so strictly navigational in character that shortly after the civil war began it was transferred to the Bureau of Navigation, under which bureau it remained until 1898, when it was transferred to the Bureau of Equipment, under the direction of which it now remains.

In 1866, the year after the ending of the civil war, the connection between the naval observatory and the depot of charts and instruments was severed by law. An act of congress passed in that year established "A Hydrographic Office for the improvement of the means for navigating safely the vessels of the navy and merchantile marine, by providing, under authority of the secretary of the navy, accurate and cheap nautical charts, sailing directions, navigators and manuals of instructions for the use of all vessels of the United States, and for the benefit and use of navigators generally." The act further provided that the secretary of the navy be authorized "to cause to be prepared," in the Hydrographic Office thus created, such "maps, charts, and sailing directions and nautical books relating to and required in navigation, and to publish and furnish them to navigators at the cost of printing and paper, and to purchase the plates and copyrights of such existing charts, maps, sailing directions, etc., as he may consider necessary."

The spirit and intent of this act of congress have been carried out from that time to this with unceasing energy and with a degree of zeal, ability, and intelligence which would reflect credit upon any branch of our government, and this has been done at the minimum of cost and under difficulties which, at times, seemed almost insurmountable. From the small depot of 1830 with a working force of two officers and one nautical expert, it has expanded to an establishment with a working force of nearly ninety technical and skilled employees, supplemented by sixteen fully equipped branch offices at the most important points on our Atlantic, Pacific and Gulf seaboards and on the shores of our Great Lakes.

And now as to the work of the office and its mode of operation at the present time. No vessel starting on a voyage is properly equipped unless her navigational outfit includes accurate charts, sailing directions, light lists, and other necessary aids to navigation for all places to be visited. The Hydrographic Office is charged with producing this navigational outfit of necessary charts, sailing directions, etc., for all parts of the world not under the jurisdiction of the United States, and in performing this duty there is no quarter of the habitable globe the waters of some portion of which have not been surveyed by vessels of our own navy.

In general, the charts referred to are constructed from surveys made by the officers and crews of men-of-war. As there can be no question as to the necessity for an accurate knowledge of the waters of the globe, our naval vessels are supplied with an outfit for hydrographic surveying. With their large crews, numerous boats, and with officers trained to the actual requirements of all practical navigational aids,

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it is clear that this service is one for which the navy is particularly well adapted in times of peace—a service which, in general, can be performed without interfering with other naval requirements, and with results which inure to the benefit of all mankind. And it is a pleasure to state that the service is one which is not considered distasteful in the navy. Frequently, due to the exigencies of diplomatic relations and for other reasons our vessels are stationed in foreign waters for long intervals of time, during which the officers and crews generally welcome surveying work as a decided break in the monotony of their confinement to the limits of the ship.

In addition to the resulting benefit to our maritime interests, the naval service is also materially benefited. The work tends to bring out the officer's powers of observation of things nautical, and to give him a familiarity with coast work which becomes invaluable in time of war. This was well exemplified during our civil war when the most successful blockade runners were commanded by men—generally ex-naval officers—who had been engaged in the coast survey in the vicinity of their blockading operations.

Now as to chart construction. In general a preliminary sheet of the work done, prepared with accuracy and with a sufficient degree of delicate draftsmanship to clearly demonstrate any inaccuracies as the work progresses, together with the records of astronmical observations, triangulation, topography, tides, currents, etc., is forwarded from the surveying vessel to the Hydrographic Office, where in the division of chart construction, now presided over by one of the most thoroughly equipped hydrographic engineers in this or any country, the work is carefully revised in every detail and a smooth sheet prepared, from which comes the working chart either from an engraved copper-plate or by a lithographic process. As soon as the finished chart is printed, all vessels of the navy serving in the locality which it indicates are supplied therewith. The merchant vessels of all nations can obtain it by purchase from the Hydrographic Office or from any of its numerous agents.

As soon as received in the Hydrographic Office the work is made a matter of record and the history of the chart commences, not to end until the chart becomes obsolete or is cancelled by another. Every correction, alteration, or addition, with the names of all connected therewith, becomes a matter of record which is carefully guarded. While sometimes, for good and sufficient reasons, the legend on the chart does not show the authority, that information is on its record.

Generally speaking, navigational charts are of three classes; General charts, coast charts and harbor charts, the coast charts occasionally being divided into special and general. General charts, as the name implies, cover a large territory, and are principally for the use of navigators in the open sea as in making long voyages. On this chart the navigator plots his geographical positions as often as they are determined, and thus is able to keep as nearly as possible a direct course to his port of destination. This chart is kept in use until the vessel gets within the limits of the coast chart, when it is put away and replaced by the latter.

Coast charts, both general and special, delineate the coasts of all countries, and for each coast are consecutive and take in such sections of the coast as will permit of the use of a comparatively large scale. The coast line is accurately delineated, as are also the principal topographical features which can be used in navigation; all the lighthouses, with their peculiar characteristics; the lifesaving stations, weather bureau stations, and all the features which in any way can enable an observer by bearings, or otherwise, to determine his position. The soundings are frequent and, in general, are run out to the 100-fathom curve. With the aid of this coast chart, the navigator pilots his ship along shore until within the limits of the chart of the harbor to which he is bound, when that replaces it.

The harbor chart is on a larger scale than the others mentioned and in greater detail. Every object on shore that can be used in piloting the ship in or out of the harbor is delineated in its correct position. Where possible ranges to guide vessels in and out are determined and plotted upon the chart; lighthouses, range lights, buoys, beacons, and all daymarks are plotted; the positions of landing places, customhouses and public buildings of which the navigator may have occasion to know are plotted where possible; curves of certain equal depths of water, quarantine stations and quarantine grounds, men-of-war and merchant ships' anchorages are also clearly indicated; the magnetic declination or variation is noted on one or more compass roses and, in addition, the chart contains all necessary data as to the date of publication, the date of the latest correction, the character of the soundings, heights, signs and abbreviations and all necessary tidal information. On these charts as on coast charts the shore lines are made especially conspicuous and the topographical features represented are such as will be of actual value as aids to the navigator.

At the present time the Hydrographic Office has in its possession nearly 1,200 engraved chart-plates and about fifty photographic chart-plates. These 1,250 plates have all been constructed from the results of original naval surveys; from geographical and cartographical data reported by the commanding officers of vessels in the naval service; and from information collected by the branch hydrographic offices, from in-coming mariners of all nationalities, and also from the geográphical information that comes into the custody of the navy department through the prosecution of surveys by foreign governments.

Besides the projecting, drawing, engraving, photographing, electrotyping and printing which constitute the central work of chart construction and chart correction, the functions of the Hydrographic Office also include the mathematical computations for the projection, the adjustment of triangulations, the investigations of the tides, the discussion of observations of the magnetic elements of the earth in their bearing upon charts and navigation; the computation of navigational tables, and the designing of instruments and machines for securing the maximum of economy.

Of the 1,250 or more charts that are now available for permanent issue, over 300 have been derived from original surveys by the United States navy. These added to the 450 or more charts that have been constructed from surveys by the Coast and Geodetic Survey make a grand total of 750 navigational charts constructed from original United States surveys, a result which places our people ahead of most of the older countries and in the front rank of the most active nations in marine hydrographic work.

Our knowledge of the depths of the sea is gradually increasing through the operations of deep-sea sounding expeditions undertaken by many nations. In this field of operation we hold a commanding position. From a scientific point of view a knowledge of the physical characteristics of the ocean bed is most desirable, and no less so from a practical standpoint. No telegraph company would think of laying a submarine cable today without first selecting a desirable route as determined by deep-sea soundings. The soundings of the U. S. S. Nero in the Pacific three years ago determined the route since selected for the trans-Pacific cable, and the possession of these soundings went a long way toward enabling our Government to name and obtain its own requirements from the cable company. Deep-sea soundings are also of

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especial value to the mariner inasmuch as from their results the existence of submarine dangers is frequently indicated. In the Atlantic the greatest accurately known depth in the fifties was obtained by the then Lieut. S. P. Lee in the U. S. Brig Dolphin—3,825 fathoms—4 1-3 miles. Only a year ago the now greatest known depth in the Atlantic, 4,662 fathoms—5¼ miles, was found by the present U. S. S. Dolphin, the first vessel of the new navy. The greatest known depth in the world is in the Pacific and is 5,269 fathoms—31,614 ft., 66ft. short of six statute miles. This depth was obtained by the U. S. S. Nero in 1900 and is greater than any elevation on our continent or, as far as we know, in the world.

The sailing directions can properly be designated as nautical guide books—in other words, nautical Baedeckers. The coasts of the world are divided up into numerous sections, for each one of which a book of sailing directions is prepared. These seamen's guide books when complete and used in connection with the corresponding navigational charts are supposed to give the mariner all the information that he may require for safely navigating the part of the world considered, and for entering and leaving each harbor or anchorage therein. When corrected to date, they give him in as much detail as possible a knowledge of the prevailing winds and weather for each season; of the tides, currents, buoys, lights and other day and night marks, and of proper anchorages. In addition, where possible, ranges to be used in entering and leaving port both by day and night are described; prominent land-marks and other topographical features are noted in detail, and everything in the way of an aid to navigation is entered therein. They even go so far as to give him information in regard to port dues, local regulations of foreign governments, diplomatic customs of the local and State authorities, the facilities for obtaining provisions, water, and other supplies, and also as to obtaining necessary repairs.

There is no guide book known which contains so much of practical importance. In all nations these books are written by naval officers or by others who have followed the sea for a profession—men who have sufficiently matured practical experience to enable them to exercise proper judgment in weighing the many varied sources of information, to reconcile conflicting statements, to set forth only the facts upon which the mariner can rely with confidence, and to exercise a care in the preparation commensurate with the interests of life and property at stake.

The aids to navigation required by mariners are numerous, but there is considered in the article only those which are prepared and issued by the Hydrographic Office. With due regard to sequence, the Notices to Mariners, issued weekly by the Hydrographic Office which particularly affect the charts and sailing directions, should be considered first. These notices consist of a collection of statements pertaining to safe navigation made up in pamphlet form which are issued weekly by the Hydrographic Office. The statements are notices themselves, pertaining to every matter which is of importance to the seaman and navigator. When a new rock, shoal or other danger is discovered and reported to the Hydrographic Office, the information is immediately published, the source and its nature being clearly set forth. The same is true of the installation of new lights, changes in lights, alterations or changes in buoyage and other day marks in any part of the world, wrecks, and all subjects a knowledge of which would tend to lessen the dangers of navigation. These notices are issued in a very convenient form for cutting out. They are distributed from the Hydrographic Office and from its numerous branch offices to all vessels of the navy and to not less than 3,000 merchant vessels, officers of which at the present time are collecting information for the Hydrographic Office. When received, the immediate duty of the navigator or master is to enter the corrections by hand on the charts affected (these charts being designated in the notices), and in addition, to cut out each notice and place it in its proper place in the sailing directions. It is not an uncommon thing for the Hydrographic Office to get cablegrams from abroad giving notices of dangers. A fair part of these notices come through the branch hydrographic offices, which are located in sixteen of our principal ports.

These offices, which are in charge of naval officers with nautical experts as assistants, are veritable bureaus of nautical information. They receive and distribute information, visiting all incoming vessels for this purpose, and hold themselves ready to examine charts from any vessel, verifying the same or pointing out necessary corrections, examining and correcting instruments, explaining nautical subjects, and in any way possible giving aid to mariners. In many cases they have even adjusted compasses. At the present time the officers at three of them are giving night lectures on navigation to ship masters. Many of these have been called as witnesses in admiralty cases and, in general, their influence in improving the means of safe navigation has been most marked. A time ball service is carried on at twelve of these offices, which is taken advantage of by the masters of vessels possessing chronometers, thus enabling them upon going to sea to feel sure of the error and rate of this most important navigational instrument.

These offices place within almost immediate reach of ship captains all the information contained in the main office and enable the main office to obtain, with accuracy and quickness, all important information brought by incoming vessels. They have been of great benefit to shipping firms, marine insurance companies, admiralty lawyers, and practically to all interests connected with maritime affairs.

Other essential aids to navigation are published by the Hydrographic Office. Amongst the most important can be mentioned the American Practical Navigator, a book on navigation which no navigator should be without. This is revised frequently and the call for it is continuous. Frequent issues of the lists of lights of the world are necessary because the changes in lights all over the world are frequent and often very radical. Azimuth Tables for the use of the navigator in determining his compass error have been issued by the Hydrographic Office for the last twenty odd years. The International Code of Signals, which by law, all mariners are compelled to have, is also an issue of this office. Publications on great circle sailing; means of searching for isolated submarine peaks; on the variation of the compass; sunrise and sunset tables; illustrated cloud forms, matter pertaining to marine meteorology and to terrestrial magnetism are amongst the practically useful issues of this office, and all are prepared by its attaches. The great majority of deep-sea vessels now afloat possess some practical aid to navigation published by the United States Hydrographic Office.

The Pilot Charts of the North Atlantic and North Pacific, the permanent issue of which was inaugurated by the Hydrographic Office in 1883, are not navigational charts strictly speaking, but are simply graphic illustrations of the conditions of winds, currents, wrecks, derelicts, icebergs, fogs, etc., which may reasonably be expected during the month for which the chart is issued. The primary credit for this practical aid to navigation is due to Lieut. Maury. When, in the early forties, he started his system of collecting information in regard to winds, currents, and other matters pertaining to the ocean, it was with a view of eventually being able to predict to the mariner, with a reasonable degree of probability, all necessary meteorological data for any period of the year.

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AT THE HEAD OF THE LAKES

Duluth, Minn., Aug. 22.—Just now the yard of the Superior Ship Building Co. is idle, with but a few men working on a boat or two in the dry docks. There is prospect that one of the later ships ordered of the American Ship Building Co., will be alloted to this yard, and the talk is that it will be a 10,000-ton vessel just ordered. This will doubtless be the only vessel to be constructed here during the winter.

Construction of the new Lake Superior & Southeastern railway, running from the head of the lake to Chicago, will begin at the northern end in the next few weeks. It is now under way further east and south. This road has been planned with great care and skill, and has a maximum grade of about 15 ft. in the mile, as compared with one of about 1 percent on competing lines. The management state that they will have the shortest and best line to Chicago, and will carry a great share of the business. It is not generally supposed that the Wisconsin Central is the power behind the new road, though it has been so stated, and that road admits that it is building the line.

It is not so very many years ago when the boat lines from the lower Lake Michigan ports to the head of Lake Superior and the copper region of this lake were doing all the business. Before the construction of the Duluth, South Shore & Atlantic and the Chicago & Northwestern from here along the south shore and direct to Chicago, the rate of freight from Chicago was something terrific, and the passenger fare was $65. That was the time when a man might become clerk of a boat in this trade and retire in a few years with a fortune, as some of them did. The fares were largely cash, and it cost $10 to go on short runs that were frequented by thousands of men looking for work in the mines and on the construction of the Canadian Pacific's "Section B" north of the lake. Now it is $25 from here to Chicago and return, and the roads have driven off not only the Lake Michigan and Lake Superior line, but have made the business of freighting along the shore very precarious.

The Booth boats from Duluth to Port Arthur and Isle Royale, have done an enormous business this year, the America up to 250 and more passengers for the round trip time after time during the past 60 days. It is generally supposed that the Booths will add larger and finer passenger ships for the coming year. It requires no stretch of the imagination to look ahead ten years and see Isle Royale converted into a vast summer resort with splendid hotels dotting its glorious shores, and almost as fine ships plying there as can now be found on Long Island sound. A large terminal coal dock is to be built at once on the property bought some time ago by Jones & Adams, for that purpose.

The company is to be known as the Northern Coal & Dock Co., and some of its contracts have already been let. The dock is to have a capacity for about 250,000 tons. It will join the new M. A. Hanna dock, that is now under construction, on the lower harbor on the Superior side of the bay. This will be the thirteenth dock for the Wisconsin side, the head-of-the-lakes harbor.

There has been a repetition of the heavy floods of six weeks ago, and a number of the larger mines of the Hibbing district are flooded out temporarily. It is astonishing that they are able to get out from under the difficulty as soon as they are, but shipments are resuming their speed, and in a few days, with no more water, will be normal. In no year in the history of the Mesabi have the floods been more severe, and never have they been as disastrous. It seems to be impossible to guard against them at some mines, though others can readily be saved.

RECORD SHIPMENT OF RIVER COAL

The largest one-day coal shipment in the history of the American coal business, according to the *Coal Trade Bulletin*, was made on July 31, when something more than 9,000,000 bushels of coal left the Pittsburg harbor for Louisville and Cincinnati.

The following table shows the names of the principal boats and their divided shipments. A coal boat carries 25,000 bushels of coal, a coal barge 15,000 bushels and a coal flat 10,000 bushels of coal. It takes from six to eight feet of water for a shipment of coal flats and barges, and ten feet of water for a coal boat.

Name of Steamer.	Coal Boats.	Barges.	Flats.	Total Bushels.
Ironsides	..	12	2	200,000
Joseph Walton	..	12	3	210,000
Volunteer	..	22	1	340,000
Tom Rees No. 2	..	12	3	210,000
Dave Wood	..	15	..	225,000
Charley Brown	..	14	3	240,000
Ed. Roberts	..	14	3	240,000
Sam Brown	12	..	4	340,000
Tom Dodsworth	10	2	2	300,000
Exporter	12	3	3	375,000
Coal City	12	3	4	385,000
Rover	..	10	1	160,000
Frank Gilmore	..	12	1	190,000
Josh Cook	2	7	3	185,000
Boaz	10	2	4	320,000
Andy Axton	..	4	..	60,000
Clyde	..	..	2	20,000
Carvon	5	..	..	125,000
Gleaner	12	3	1	355,000
Robert Jenkins	5	..	..	125,000
Tornado	..	10	..	150,000
T. W. Thomas	8	3	2	265,000
I. N. Bunton	5	..	1	135,000
Sam Clark	10	3	2	365,000
Iron Age	12	3	4	385,000
Charley Clark	5	..	..	125,000
Bertha	5	..	..	125,000
Voyager	5	..	..	125,000
Rival	..	10	..	150,000
W. W. O'Neil	11	2	3	335,000
Cadet	..	6	..	90,000

The present year promises to equal the great record made in 1896, when a coal shipment was made from Pittsburg every month. That year there was plenty of work for rivermen, and this year they have not been idle. In 1896 a great quantity of coal was shipped from Pittsburg, but with the new methods in vogue the shipments of the present year, with anything like an even break in the weather, will exceed the shipments of nine years ago by a big margin. In June of this year there were over 15,000,000 bushels of coal shipped in a few days, and millions of bushels were shipped before and after that time.

It is the accepted rule with rivermen that if there is a June rise that will permit a coal shipment being made nothing more will be done in the same line until September at least. But this year, instead of an ordinary river swell in June it attained a goodly size, the shipping record for the month being broken. Early in July another shipment of coal was made.

Two boats are being built for the Canadian Pacific Railway for use on the St. Lawrence route. They are being built by Fairfields on the Clyde, and will register 14,000 tons each, being the largest on the St. Lawrence route. They are expected to develop a speed of 18 knots, and will be in commission in the spring of 1906. The boats are to be known as the Empress of Germany and the Empress of Austria.

The steamer Frances H. Leggett reached San Francisco on July 28, from the Columbia river, towing the largest log raft that ever came down the Pacific Coast. It measures 620 feet in length, 55 feet in beam and 23 feet in depth. It contains nine million feet of lumber and fortunately reached its destination uninjured.

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COMMERCE OF SUEZ CANAL

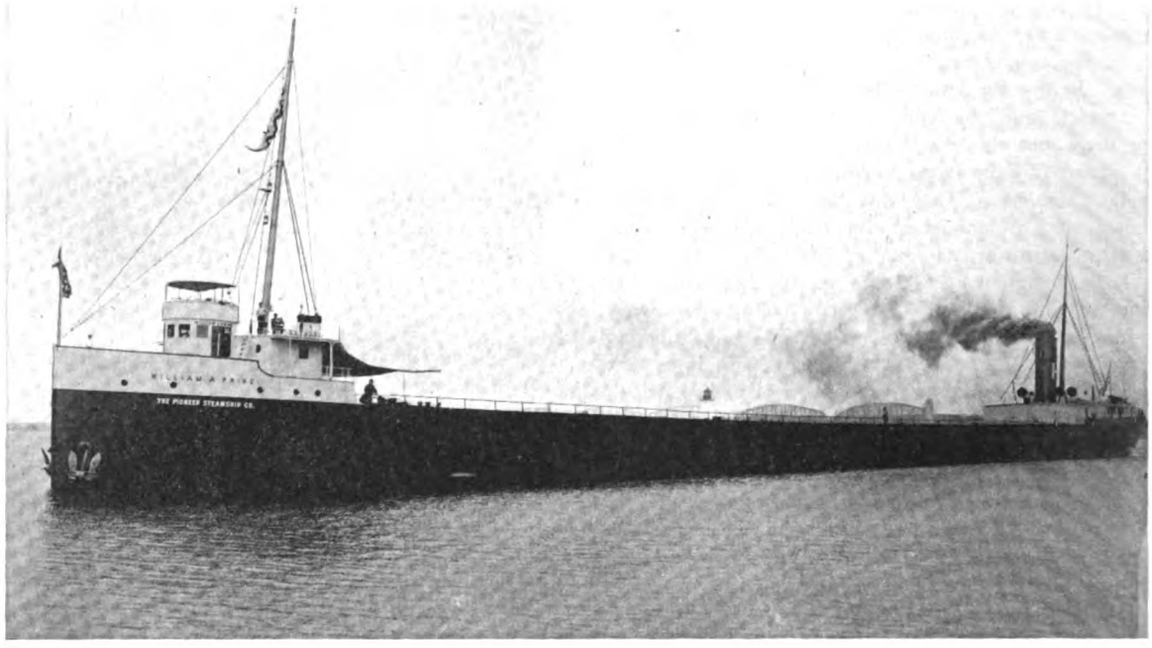
The annual report of Mr. Consul Cameron on the trade and commerce of Port Said for the year 1904 contains the following relating to the traffic and navigation of the Suez canal:

Dimensions of Suez Canal.—The navigable dimensions of the canal in 1905 are practically double what they were twenty years ago, the superficies of the vertical profile having been increased from about 320 to 580 square metres in the ordinary channel, and to 740 square metres in the numerous gares or crossing places, the dredging being so carried out as to exceed the limits originally agreed upon. The following details have been taken from a memorandum kindly furnished by M. Perrier, the chief engineer of the company:

From 1869 to 1875 the canal retained its depth of 8 metres (26 ft. 3 in.), and its bottom width of 22 metres (72 ft.) throughout its length of 160 kiloms., or 99 miles. The gares. or crossing places, were about 10 kiloms. apart, each gare being about 1,100 yards long. From 1875 to 1884 the first improvements were made in straightening and widening the curves. During 1887 and 1888 the canal was deepened half a metre, the bottom width being reduced (on the same slopes) to 18 metres. This extra depth allowed the transit of vessels with a draught up to 7.80 metres (25 ft. 7 in.). From 1888 to 1895 the bottom width was increased to 33 metres (108 ft.), and the curves were also improved. The result was the diminution in time of transit which had already been shortened by the use of the electric light since 1887, and ships could now pass at any point of the straight reaches of the canal instead of only at the gares. From 1898 to 1904, owing to increased dimensions of ships, larger passing stations were commenced, some twenty in number at intervals of three miles, each passing station having an effective length of 820 yards with approaches of 328 yards at either end. At each the bottom width of the canal is 50 yards, the width at the water-level over 100 yards, while the depth of the passing station itself is 9½ metres. At the same time the depth of 8½ metres in the channel had been increased to 9 metres (29½ ft.), so that on Jan. 1, 1902, a draught of 8 metres (26 ft. 3 in.) was allowed, instead of 25 ft. 7 in. The work of deepening the channel is steadily proceeding, with the intention of arriving at a uniform depth of 9½ metres, or 31 ft. From kilometre 61, near ElFerdan, as far as Suez, the bottom width is to be increased from 102 to 128 feet. The curves are also being improved, and a large gare is being constructed in the small Bitter Lake. Taking the canal as a whole, it may be said that its width on the water-level in the northern half is from 100 to 120 yards, and in the southern half from 80 to 100 yards. Lastly, the widening of the channel at Port Tewfik will enable battleships and large cruisers to coal rapidly alongside the buoys, instead of having to coal slowly in the roads.

Traffic and Navigation.—Four thousand two hundred and thirty-seven vessels of a net tonnage of 13,401,835 tons passed through the canal in 1904, as compared with 3,761 vessels of 11,907,288 tons in 1903, showing an increase of 476 vessels and 1,494,547 tons. Of these 4,237, 3,287 were merchant vessels, 752 mail steamers, and 198 warships, transports and government chartered vessels. The transit receipts have risen from 103,620,268f. in 1903 to 115,818,479f. in 1904, the highest total since the opening of the canal. This increase is due to heavy shipments of wheat from India to Europe, and to the large quantities of coal consigned to the East. The transit of coal exceeds the shipments during 1903 by about 500,000 tons, principally perhaps for the use of the belligerent fleets. The mean net tonnage has risen from 1,000 tons in 1871 to 1,500 tons in 1880, to 2,000 tons in 1890, to 2,500 tons in 1896, to 2,800 tons in 1900, and to 3,163 tons in 1904. The mean duration of transit remains about the same, namely, 18 hours for all vessels; but the general effective rate for mail steamers may be estimated at 15½ hours. The use of the electric light has become practically universal, amounting to 96 percent.

Draught.—Until the end of 1901 the maximum draught allowed was 25 ft. 7 in., and during 1904, 705 vessels, drawing more than 24 ft. 7 in. used the canal, as compared with 566 vessels in 1903 and 431 vessels in 1902. Since Jan. 1, 1902, the maximum draught allowed has been raised to 26 ft. 3 in.



STEAMER WILLIAM A. PAINE OF HUTCHINSON & CO.'S FLEET.

[*Built at the Cleveland yard of the American Shipbuilding Co.*

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(8 metres), and in 1904, 145 vessels availed themselves of this increased depth. On Jan. 1, 1906, the maximum will be raised to 27 ft. (8 metres 23 centimes).

Dues.—The original tariff for laden ships was 10f. per ton in 1869. This was raised to 13f. in 1874, but was lowered 1½f. per year from 1877 to 9f. in 1893, and to its present rate of 8f. 50c. in January, 1903. On Jan. 1, 1906, the rate will be reduced to 7f. 75c. For ships in ballast the tariff has always been 2f. 50c. less.

British Shipping.—Out of a total of 4,237 vessels, 2,679 were British, an increase of 401 vessels over 1903 and 514 vessels over 1902. British net tonnage has also risen to 8,833,920 tons in 1904, an increase of 1,430,376 tons over 1903, and of 2,061,018 tons over 1902. The percentage of British vessels has steadily risen from 56 percent in 1901 to 62.2 percent in 1904, and our net tonnage from 57.8 percent in 1901 to 65.9 percent in 1904, or about two-thirds of the whole traffic. These figures apply only to the general total of 4,237 vessels; but if we consider only merchant vessels, the British percentages have risen during the last four years from 67 to 74 percent in number and from 71 to 76 percent in net tonnage, or three-quartes of the mercantile traffic of the canal.

German Shipping.—During the last three years the percentages of German vessels have been 12.9 percent in 1902, 13.1 percent in 1903, and 12.8 percent in 1904; and of their net tonnage 15.2 percent in 1902, 14.9 in 1903, and 14.7 in 1904. France, the Netherlands, Norway, Austria-Hungary and Italy combined furnish a total of 10.5 percent of the vessels and 8.7 percent of the tonnage. These facts are reassuring, and show that the British mercantile marine is more than holding its own in the canal traffic. A proof of this may be seen in the following table of the great companies which use the canal. Of these 40, 27 are British, five German, three French, two Dutch, and one each Austria-Hungarian, Italy, and Spanish.

PRINCIPAL COMPANIES WHOSE VESSELS PASS THROUGH THE SUEZ CANAL.

Name of Company.	Tonnage.	Number of Voyages.
*P. & O. Steam Navigation Co.	1,064,500	242
*Alfred Holt & Co. (China Line)	690,700	175
Hansa (German	653,300	186
*Cayzer, Irvine & Co. (Clan Line)	475,400	166
Norddeutscher Lloyd	451,300	97
Messageries Maritimes	444,300	142
*George Smith & Sons (City Line)	423,600	106
Hamburg-American Line	378,600	94
*T. & J. Harrison (Charente Steamship Co.)	358,300	74
*Henderson Brothers (Anchor Line)	318,600	95
*British India Steam Navigation Co.	262,600	76
Nederland Stoomrt. Mij	248,000	88
*Bibby Brothers	223,000	52
*Orient-Pacific Steam Navigation Co.	213,800	52
Rotterdamsche Lloyd	202,800	80
*P. Henderson & Co. (Burmese Line)	193,600	58
Deutsche Ost-Afrika Linie	165,200	57
*F. Strick & Co. (Anglo-Persian Co.)	162,300	70
Deutsche-Australische Linie	153,900	45
*T. J. Brocklebank & Co.	149,500	39
*Rickinson & Sons	148,400	56
*R. Alexander & Co. (Hall Line)	128,200	43
*Runciman & Co. (Moor Line)	127,300	48
Navgazione Generale Italiana	123,000	52
*Bucknall Bros. (British Colonial Co.)	119,500	46
*James Marke Wood	116,900	39
*J. MacDonald & Co. (Anglo-Amer. Oil Co.)	116,700	35
*T. Wilson, Sons & Co.	113,900	35
*M. Samuel & Co. (Shell Line)	103,700	23
*Greenshields, Cowie & Co. (Knight Line)	98,600	20
Compagnie des Chargeurs Reunis	91,800	23
*E. Bates & Sons	91,700	28
*R. Ropner & Co.	90,300	35
*Sir James Laing & Sons	80,400	30
Compania Transatlantica (Spanish)	79,800	26
Compagnie Nationale	75,900	23
*Rankin, Gilmour & Co.	75,700	24
*Tyzack, Branfoot & Co.	72,700	25
*Thomson & Co. (Ben Line)	65,400	24
Other owners and Governments	3,884,500	1,505
Total	13,401,800	4,237

*Those marked with an asterisk (*) are British lines.

CHICAGO GRAIN REPORT

Chicago, Aug. 22.—Receipts and shipments of the past week are well up to the average but due to the interrupted output in ore at Lake Superior quarters, vessels were accumulated somewhat to the excess of current shipping call. The market therefore, while quotable at old basis of 1¼c Lake Erie corn, is under dull tendency—some of the larger carriers having to shade a trifle for suitably located cargoes. The Montreal through routing rules fairly firm at 37sc corn.

Flour shipments of the past week, 88,000 barrels, against 84,400 barrels of the previous period, and the movement in other package freight commodities reported to be reasonably active. Railroads are preparing for an active Fall business: the Western lines, in close competition for the handling of new grain, have already announced material reductions in carrying charges which, with other indications, give promise of an early as well as extensive movement. Adding to the encouraging returns of United States crop as recently reported, competent authorities have estimated that the Canadian crop will run close to 100,000,000 bushels wheat.

Shipments of the week as summarized below distributed about as follows: Via all rail lines of wheat, 194,000 bu.; corn, 267,000 bu. and oats, 1,188,000 bu.; via lake to Buffalo and other American points, of wheat, 313,950 bu.; corn, 1,480,000 bu.; and oats, 150,000 bu.; and to Canadian points via lake, of wheat, 56,000 bu.; corn, 486,000 bu. and oats 231,000 bu.

Lake and Rail Shipments.

	This week.	Last week.	Same week last year.
Wheat	563,717	410,090	356,212
Corn	2,234,397	2,970,774	1,567,432
Oats	1,569,225	1,300,405	1,479,517
Rye	11,342	1,535	4,156
Barley	49,894	4,825	41,844
	4,428,575	4,687,789	3,449,161

	Since Jan. 1, 1905.	Same time last year.
Wheat	8,515,528	8,979,046
Corn	59,059,884	42,228,896
Oats	33,740,180	29,845,496
Rye	627,593	828,733
Barley	2,492,309	2,802,389
	105,035,394	84,684,560

Stock of Grain.

	This week.	Last week.	Same week last year.
Wheat	5,120,000	4,648,000	2,687,000
Corn	3,998,999	3,684,000	3,257,000
Oats	6,604,000	5,125,000	3,759,000
Rye	119,000	125,000	563,000
Barley	23,714	15,714	69,000
	15,864,714	13,597,714	10,335,000

A new type of steamer, as far as inland Michigan waters are concerned, has been successfully launched at Grand Rapids, and will be placed into service on the Grand River. The steamer, named Grand, is a stern wheeler of Western river type and will be placed in commission about Oct. 15 for the Grand Rapids & Lake Michigan Transportation Co.

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PONTOONS TO FLOAT A STRANDED STEAMSHIP

During a dark night many months ago the steamship George W. Elder ran on a reef of sharp rocks in the Columbia river some forty miles below Portland, Ore. The accident was due to the sudden disablement of the steering gear in making a short turn. Several holes were knocked in the steel hull. No lives were lost, but most of the cargo was. The Elder ran on the San Francisco-Portland route, and was on her trip to the former place when the accident occurred. Persistent efforts have been made by the underwriters to raise the vessel and float her from the rocks, but without avail. About $5,000 have been expended fruitlessly.

Eight great cylindrical pontoons are now being built at Portland that are to be used in floating the stranded vessel. This means a novel plan has been formed after many other devices have failed. These pontoons will be sunk alongside the vessel and connected by heavy cables underneath the hull. A powerful air compressor will then force the water out of the pontoons, and it is expected that the steamer will rise without further trouble. The Elder has been sold to private parties by the underwriters. It is claimed that the vessel can be repaired and made as staunch as ever.

CAPTAIN BACON, D. S. O., R. N, ON SUBMARINES

Captain Bacon, addressing the Institution of Naval Architects on "The Causes of Accidents to Submarine Boats and Their Salvage," said that the details of the boats used and the practical results attained were very properly kept secret by the admiralty, but the prevention of accidents, far from being confidential, was a matter rather of common humanity. It was necessary to accentuate the fact that every boat designed was designed to fight, they were no mere playthings, not mere structures of scientific interest. There would be no difficulty in designing a mere submarine boat with a maximum of safety devices, but with the minimum of fighting efficiency. The accidents that had occurred were not such as to destroy confidence in the general system of submarine work. But before adopting any special appliance or constructional complication, care should be taken that the fighting efficiency of the boat should not be seriously affected, and that such arrangements should be efficient against all reasonable accidents. It was simple to design a boat to be safe against any particular accident. The impossibility lay in designing one safe against any accident. At present the work the boats did was up to the full requirements of war training.

TRADE NOTES

The Standard Motor Construction Co., of Jersey City, is making two engines of 300 H. P. each for the United States navy department, one to go to Portsmouth, Va., and the other to Portsmouth, N. H., for high speed ferry service.

The Allegheny Forging Co., Pittsburg, Pa., with offices in the Frick building, has just issued a price list of chain which is very concise and compact and is well worth writing for by any one interested in chains. A circular has also been issued by the company giving a price list of rivets and burrs.

The Atlantic Works, Inc., Twenty-eighth street and Gray's Ferry Road, Philadelphia, Pa., has received an order from Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, for one of their B-11 adjustable bevel band saw machines which tips 45 degrees each side of the center.

The B. F. Sturtevant Co., Hyde Park, Mass., has just issued a circular concerning the Sturtevant Generating Sets. The vertical single engines are designed for continuous operation at high speed; the vertical compound engines were specially designed under the rigid specifications of the United States navy department for the attainment of maximum efficiency They represent the most advanced practice in modern steam engineering.

Katzenstein's automatic improved metallic packing is being installed in the main engines of the large new cruiser Yorck, of the German navy. A large consignment of this packing has just been shipped to A. G. Techlenborg Co. of Geestemunde, Germany, and another lot has just gone to the Russian navy for the navy yards at Nicolaieff. The engines of the four new ferry boats of the Lackawanna railroad are also being packed with this packing. This packing is manufactured by L. Katzenstein, 358 West street, New York.

The East End Boiler Works, 11-19 St. Aubin avenue, Detroit, Mich., has just completed and placed in the tug Home Rule, owned by the Hackett Wrecking Co., Amherstburg, Ont., a new large Detroit water tube boiler of which the East End Boiler Works are the sole makers. The new boiler occupies the same space as the old one but contains 45 percent more heating surface. As evidence of its steaming qualities it may be mentioned that on going up the river to receive the boiler the tug left the smokestack at Amherstburg and that after receiving the boilers she returned to Amherstburg without a stack under her own steam, the boiler furnishing steam readily without the draft that would have been available if the smokestack had been in use.

Unless a hydraulic jack is absolutely reliable the engineer, mechanic, railroad man or whoever is using it, is better without it. Just at the critical moment, when everything depends on a jack "standing up," a poorly made device is liable to give way. In the Watson-Stillman hydraulic jacks, every such element of uncertainty is eliminated, hence the confidence reposed in them by those who have to trust life and limb to the dependability of a hydraulic jack. The cylinders and rams, for which, in some makes, so-called seamless tubing is thought good enough, are in the Watson-Stillman jacks forged from solid steel billets, forged and bored like the cylinder of a high-class steam engine. Valves, glands, pistons, etc., are made and finished with equal care, packings and other parts subject to wear are easily accessible and replaceable, the result being a hydraulic jack so thoroughly dependable and constantly ready for service, that it holds first place among this class of tools. The manufacturers, Watson-Stillman Co., 46 Dey street, New York, have a list of about 300 styles of hydraulic jacks, which they will send on request.

We have recently received from the Burt Manufacturing Co., of Akron, Ohio, a very handsome catalogue which describes in detail the various oil filters and exhaust heads manufactured by this company. The Burt Manufacturing Co. is the largest manufacturer of oil filters in the world, and its new catalogue has been conceived and executed on a scale which accords with its reputation, as it is said to be the largest and handsomest catalogue of this class of goods which has ever been issued. It illustrates and describes the Cross, American and Warden oil filters, the American oil filtering system, and the Burt and Standard exhaust heads. The valuable information which it contains in reference to the filtering of oils makes it a valuable work of reference, worthy a place on the desk of anyone operating a power plant. It also describes fully the Unit Type of oil filters, which is used in connection with the American oil filtering system. Everyone interested in the running of a power plant is invited to write the Burt Manufacturing Co., Akron, O., for a copy of this handsome publication.

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VOL. XXXII. CLEVELAND, AUGUST 24, 1905. NO. 8.

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Written by
RALPH D. WILLIAMS
(Editor the Marine Review)

THE PENTON PUBLISHING CO., Cleveland, O.

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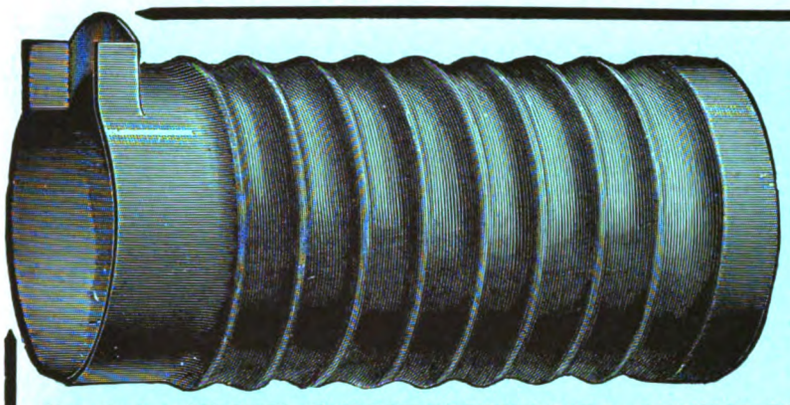

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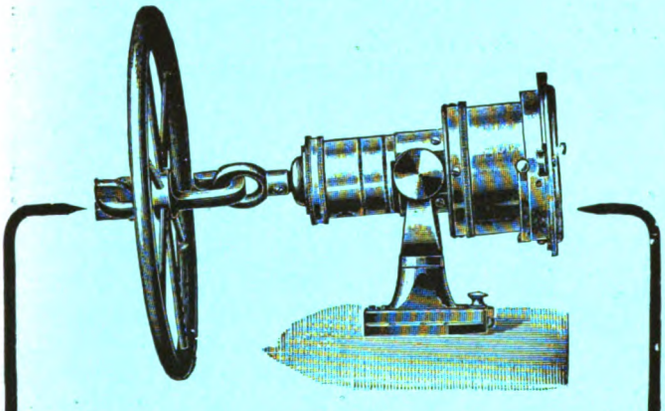

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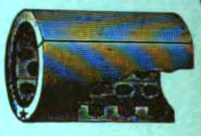

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HIGH PRESSURE
COMPOUND
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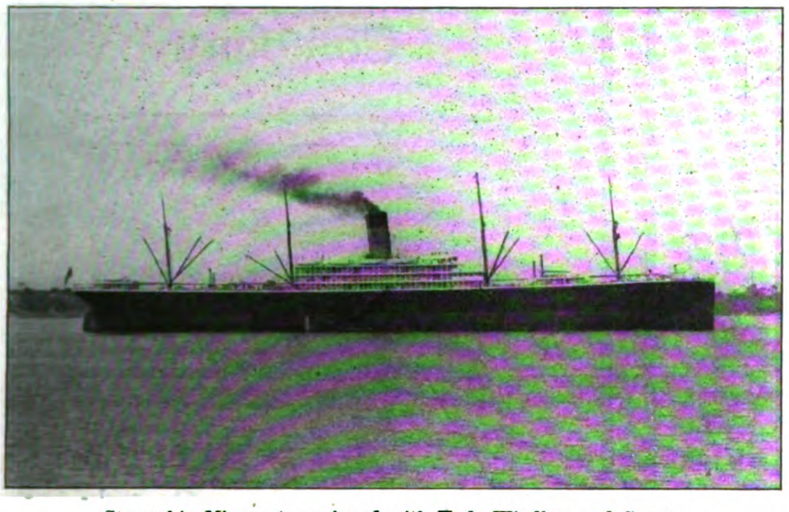

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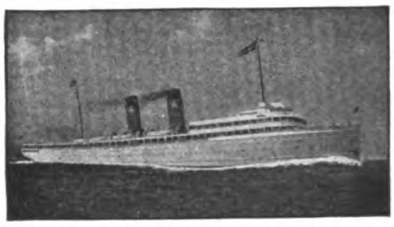

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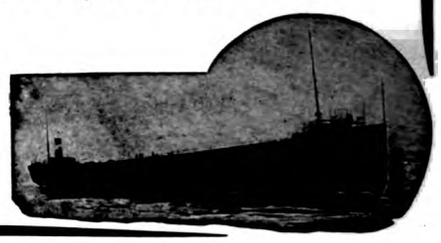

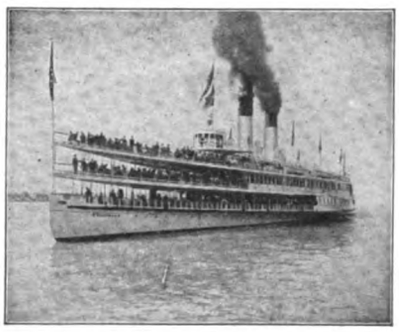

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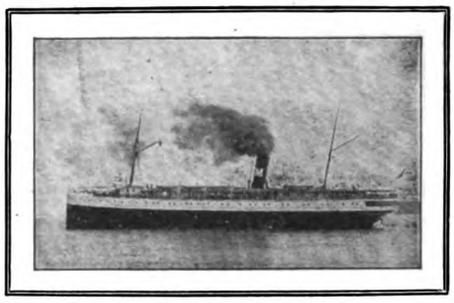

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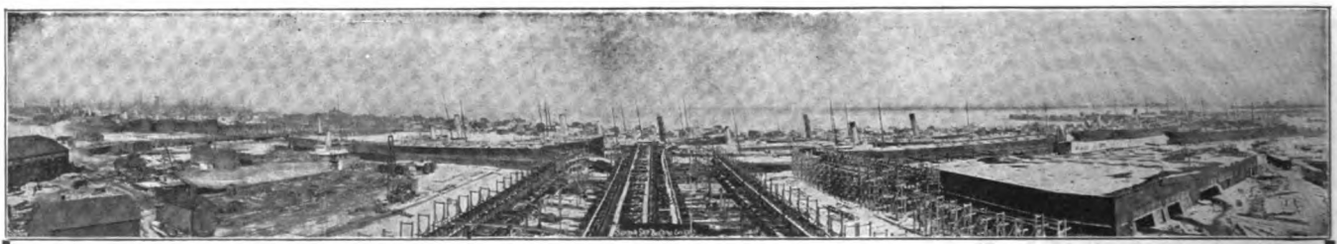

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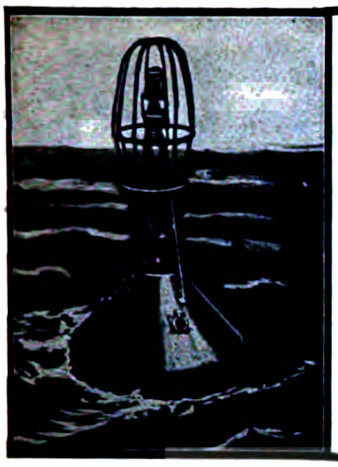

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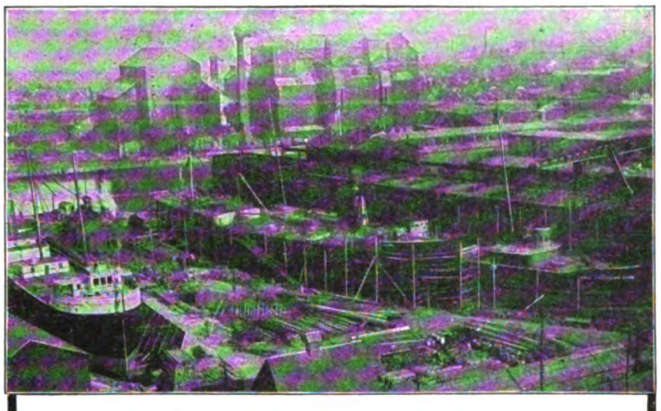

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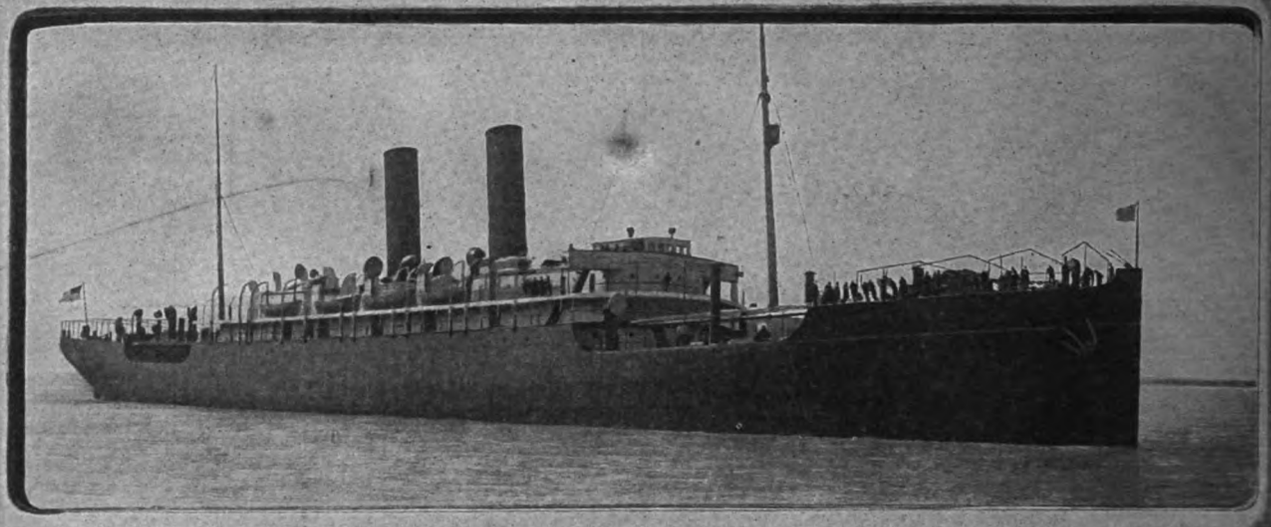

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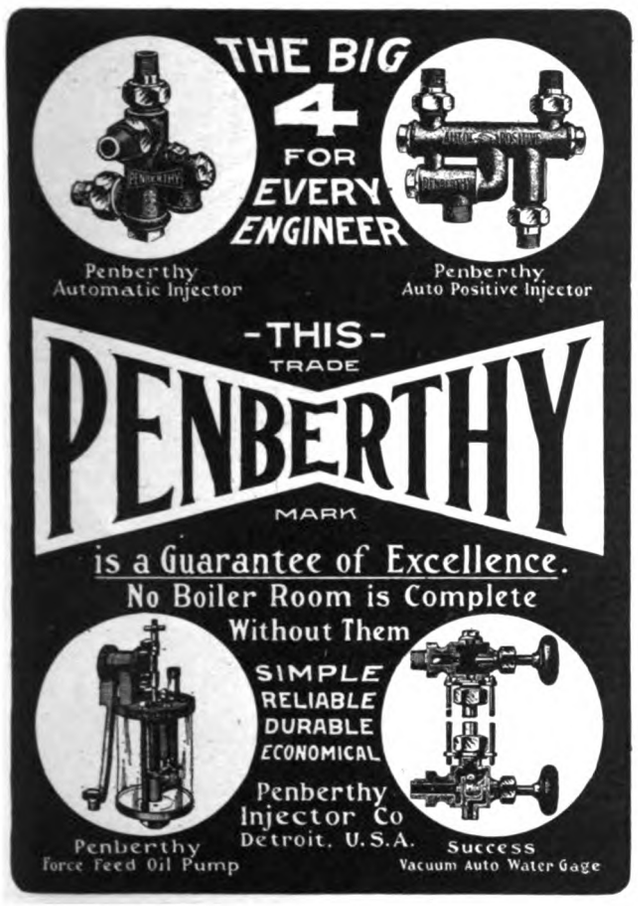

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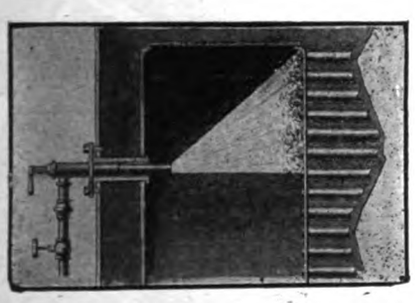

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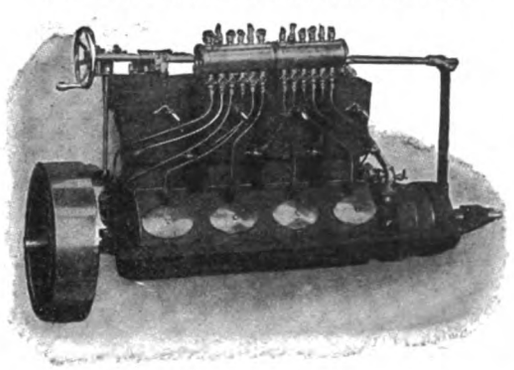

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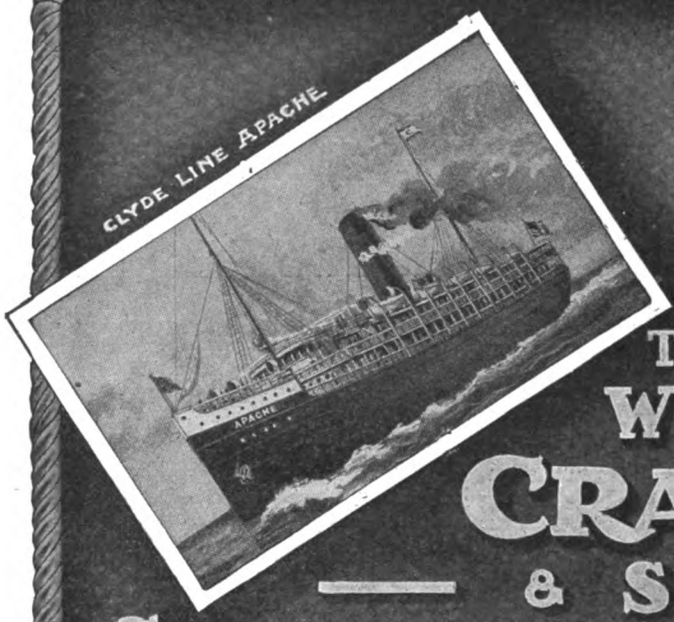

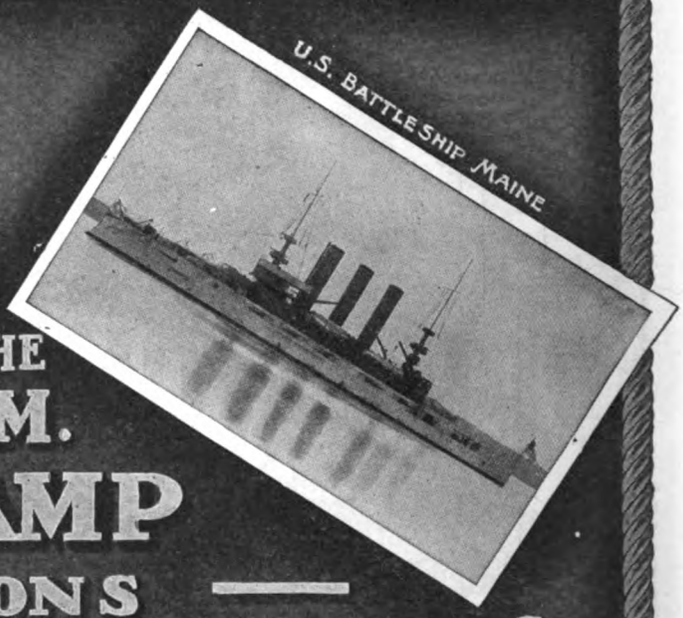

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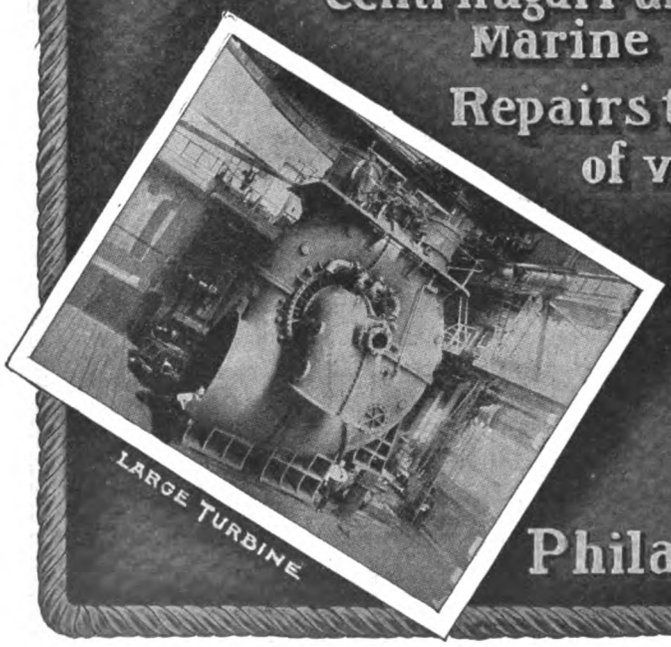

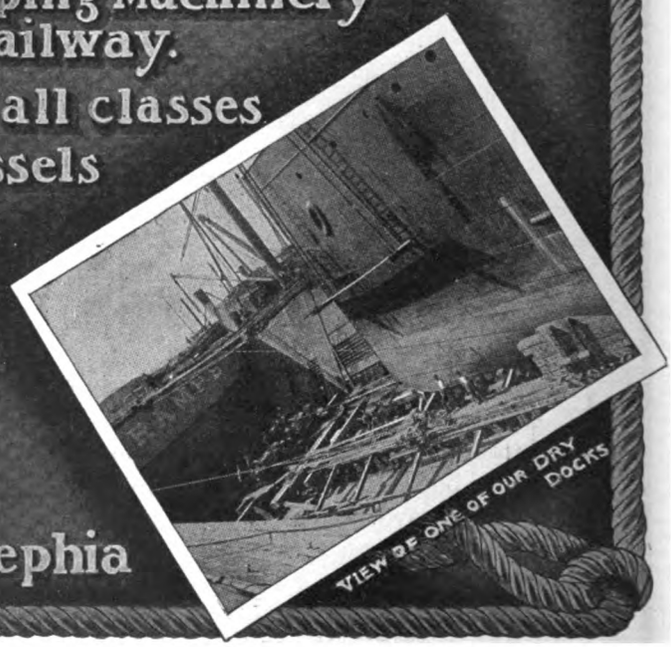

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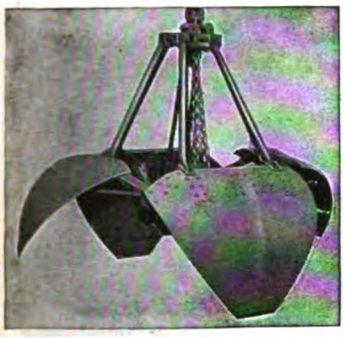

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Orange Peel and Clam Shell Types
for handling Coal, Iron Ore and Excavating

We guarantee our Orange Peel to always fill in large lump Soft Coal and Iron Ore. Has two flat lips and will not damage boats or cars. Are from 30 to 50% lighter than any other buckets.
Digging ability due to powerful system of leverage.

Write for Catalogue and Prices.

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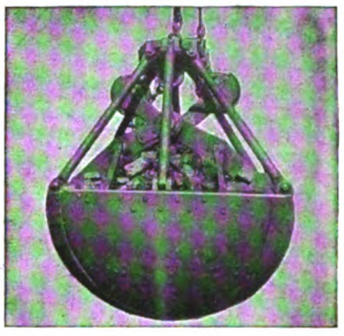

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1,800 Feet of Dock. 6 McMyler Derricks. Capacity 8,000 Tons Daily.

Fuel Lighters.—"KANAWHA." "PENNSYLVANIA." "HOCKING."

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SMITH'S COAL DOCK, Detroit River, DETROIT, MICH.
12 Pockets. Platform. Low Dock.

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MARINE SUPPLY COMPANY——STORE AND ICE HOUSE ON DOCK.

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Steamboat Fueling Facilities at Various Points on the Great Lakes

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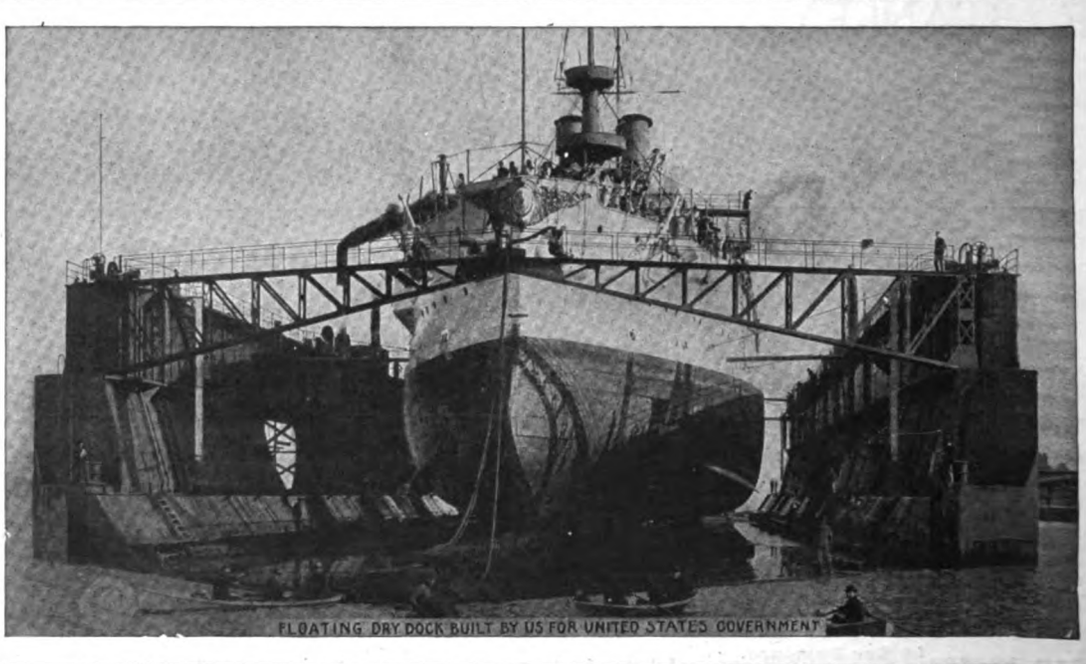

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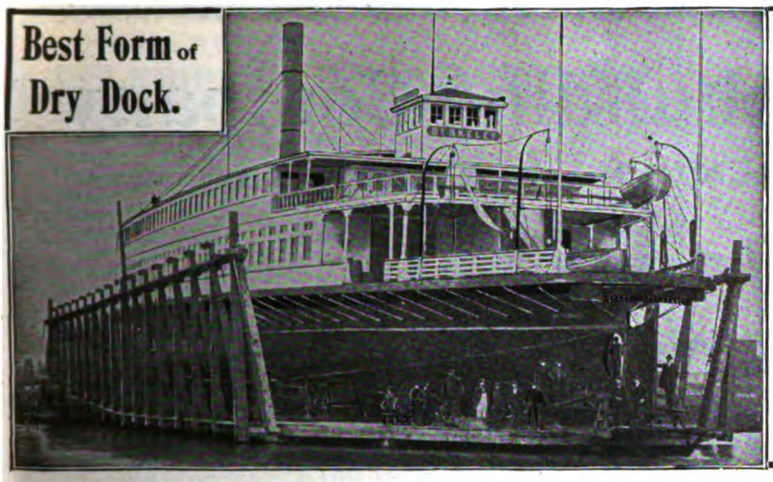

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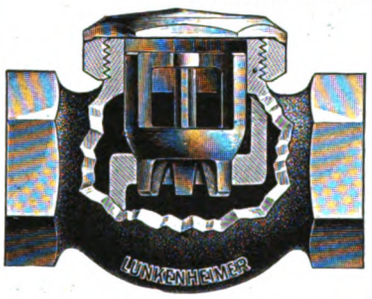

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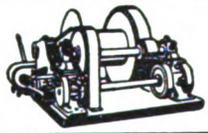

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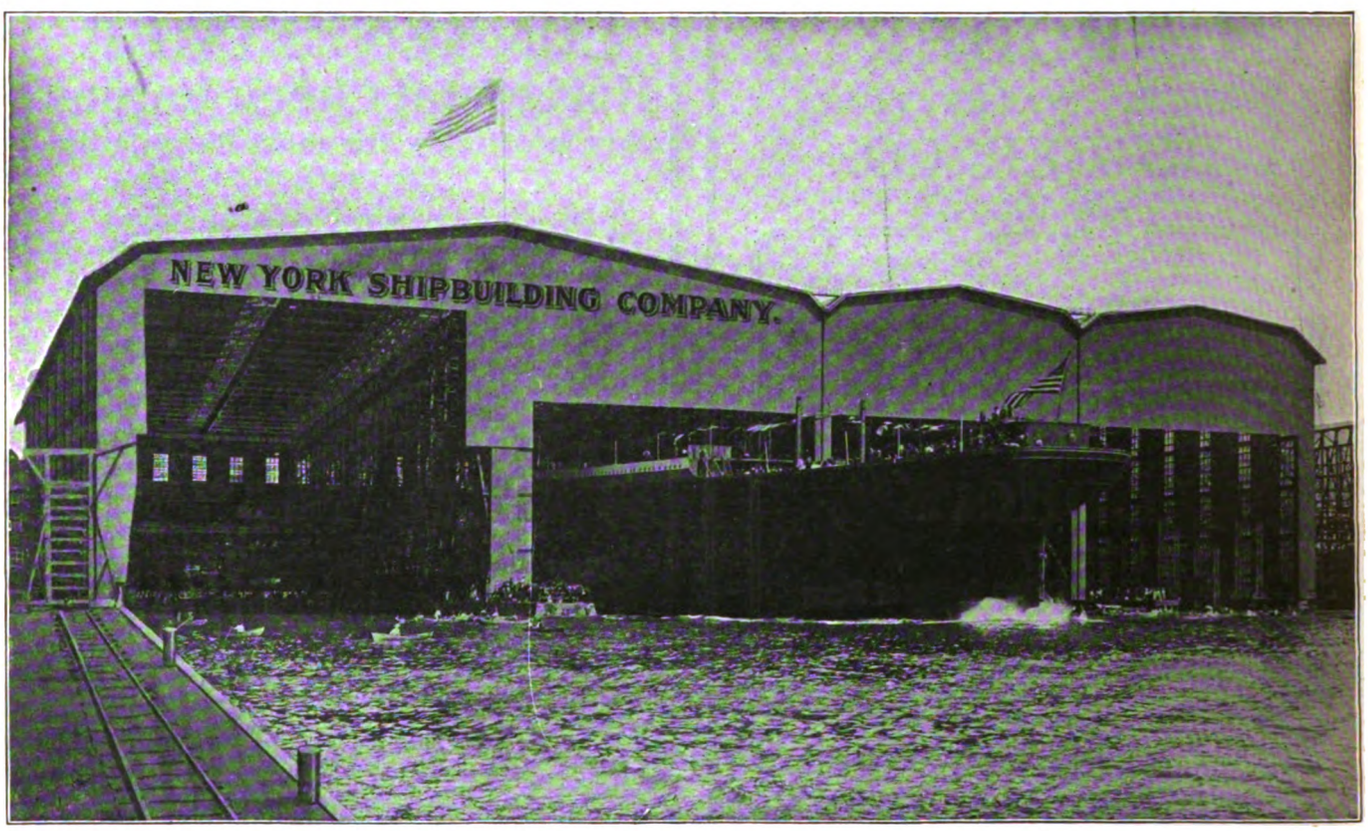

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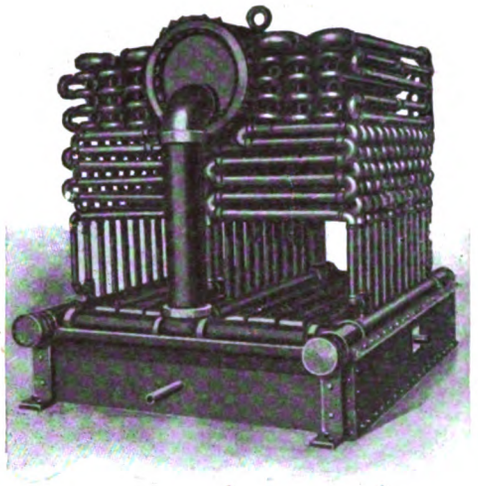

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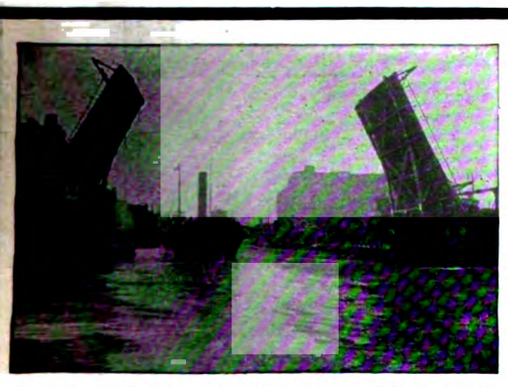

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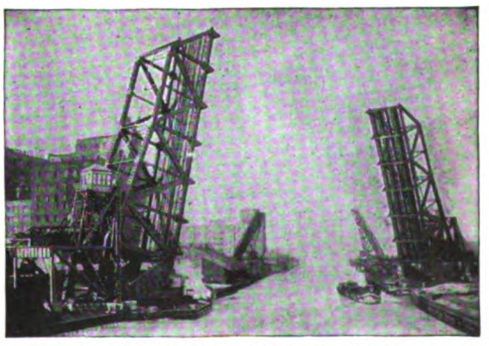

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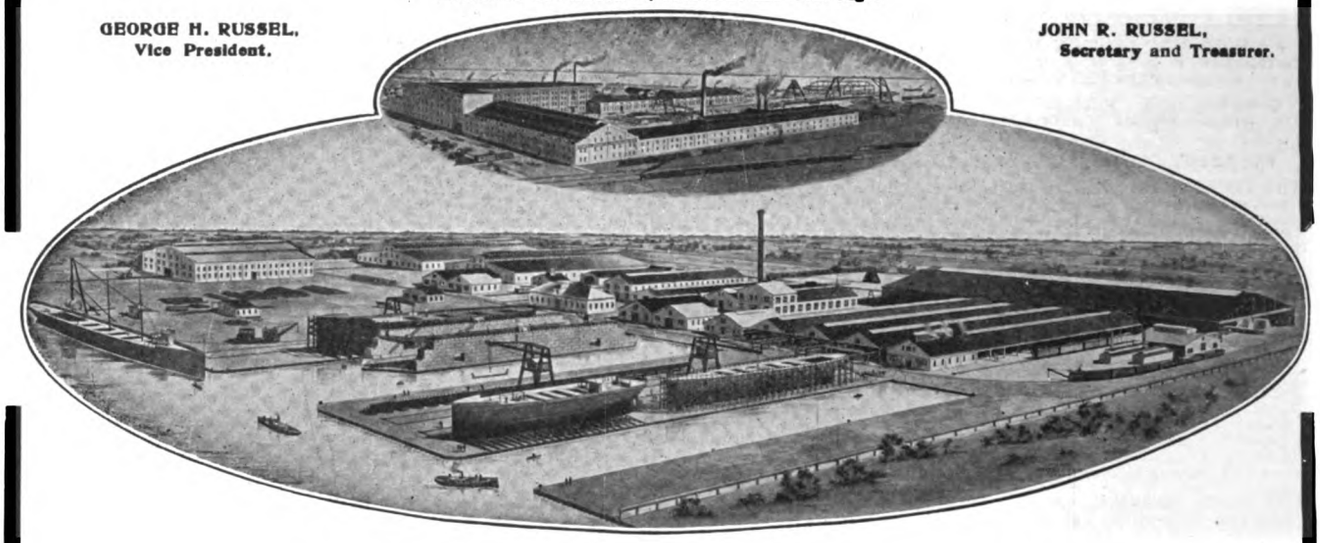

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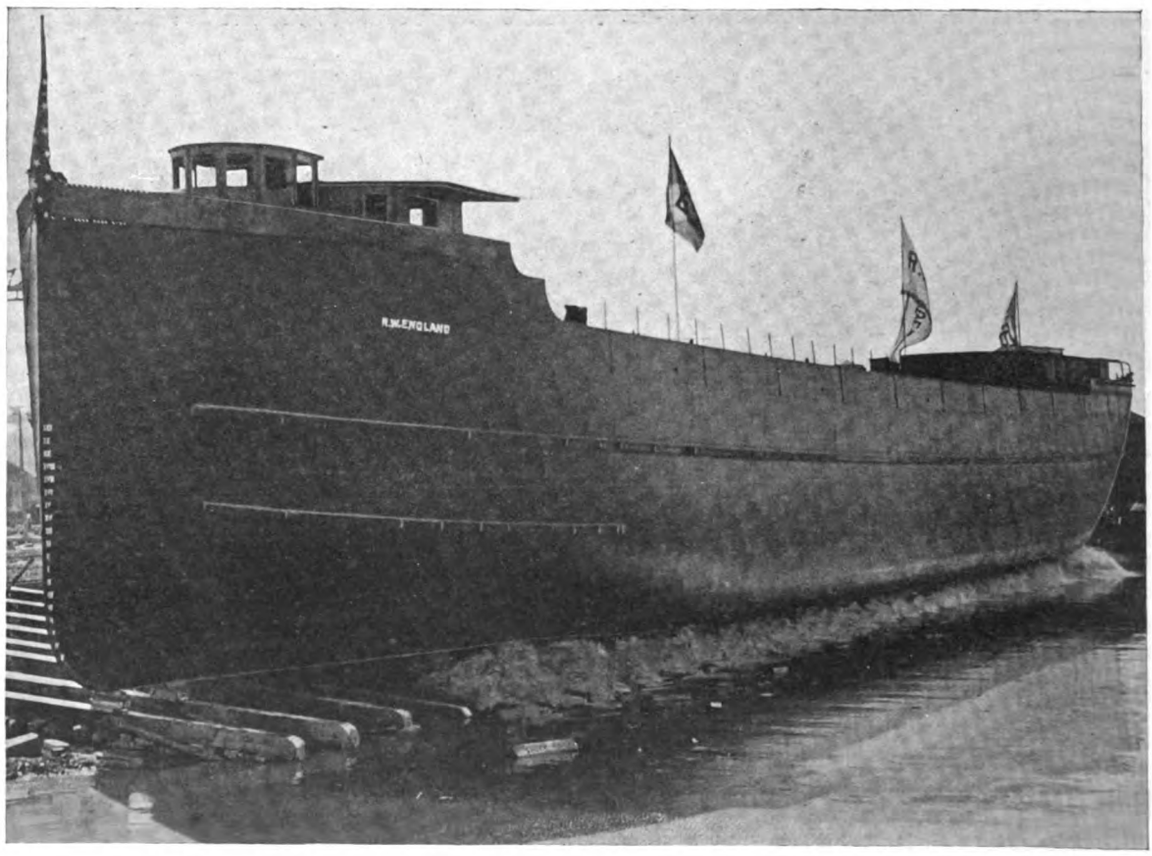

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See accompanying index of Advertisers for full addresses of concerns in this directory.

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U. S. ENGINEER OFFICE, Grand Rapids, Mich., August 7, 1905. Sealed proposals for extension of West Breakwater at Petoskey, Mich., will be receivd here until 3 p. m., September 6, 1905, and then publicly opened. Information furnished on application. M. B. ADAMS, Col. Engrs. (Aug. 31.)

PROPOSALS for Dredging Pumps, etc., U. S. Engineer Office, Custom House, St. Louis, Mo., Aug. 9, 1905. Sealed proposals, in triplicate, for furnishing centrifugal dredging pumps, pillow-blocks, tie-beams, pipe lines and flexible joints will be received here until 12 noon, Sept. 8, 1905, and then publicly opened. Information furnished on application. THOS. L. CASEY, Major, Engrs. Aug 31

U. S. ENGINEER OFFICE, Duluth, Minn., Aug. 19, 1905. Sealed proposals for U. S. Engineer Building at Duluth, Minn., will be received here until noon, Sept. 18, 1905, and then publicly opened. Information on application. CHAS. L. POTTER, Major Engrs. Sept. 14.

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For Sale, Cheap.

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Burned on spar-deck, forward only—easy to cut down to lumber barge, to carry million feet. Machinery, boilers and hull untouched and in good condition. Boat in dry dock and thoroughly overhauled last summer. Can be seen in Chicago. Address Room 613, 59 Dearborn St., Chicago. t f

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For freight service only, a boat 125 to 135 ft. long, 25 ft. beam, 5 to 6 ft. draught and speed ten miles per hour. Address C. J. Smith, Gen. Mgr. R. & O. Nav. Co., Montreal, Can.

Wanted.

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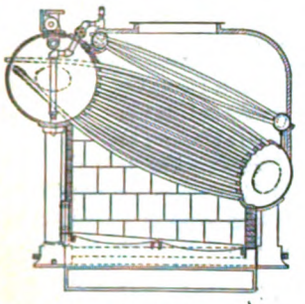

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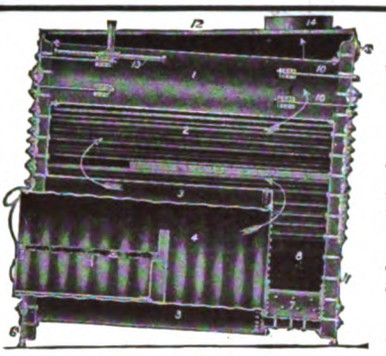

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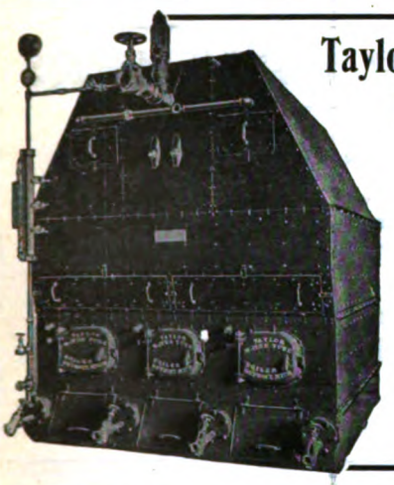

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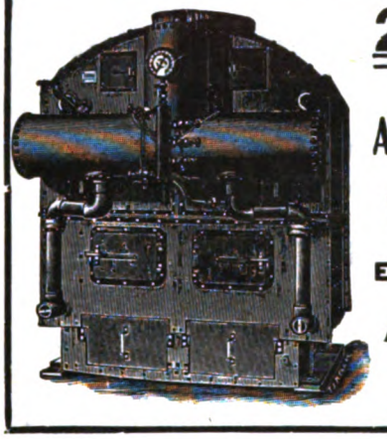

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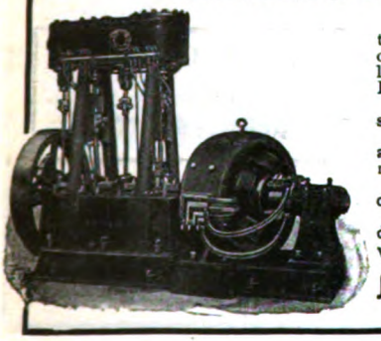

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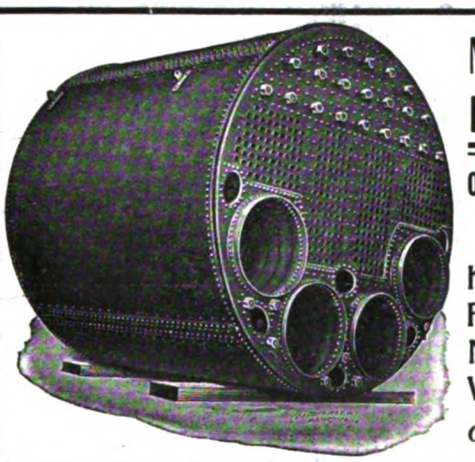

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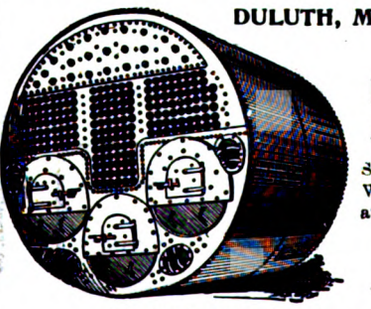

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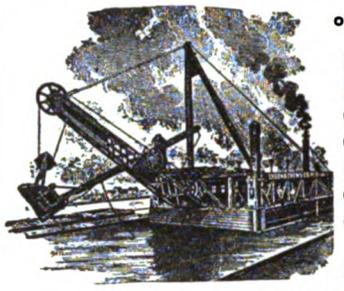

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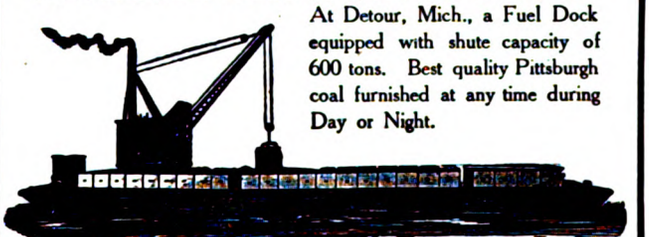

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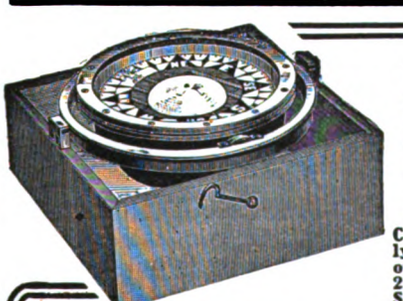

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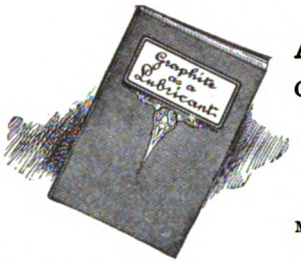

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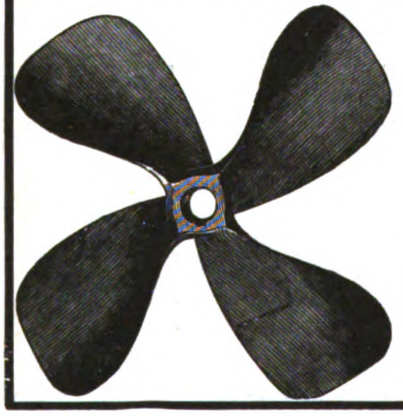

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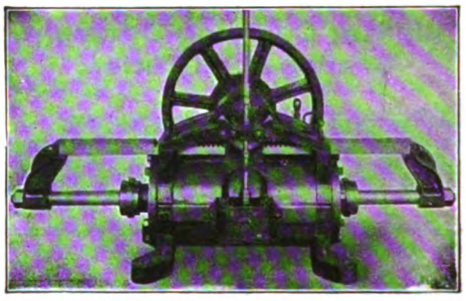

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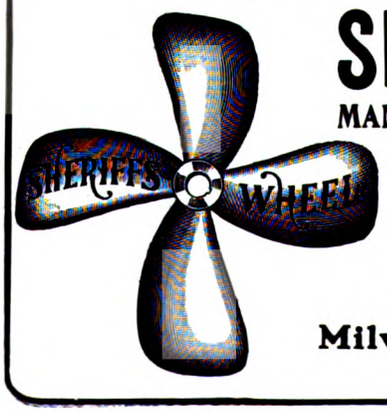

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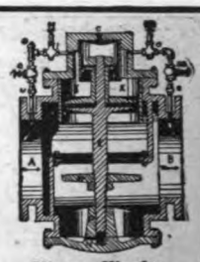

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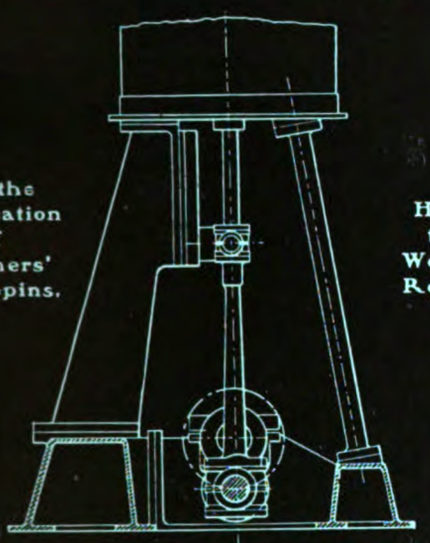

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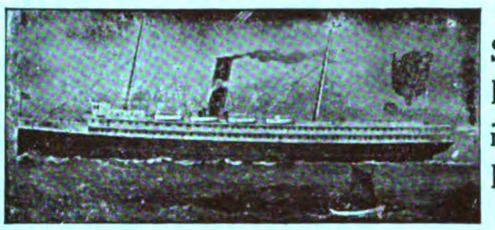

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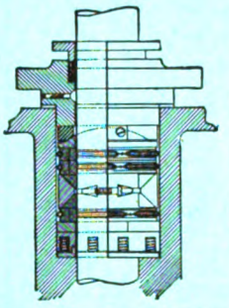

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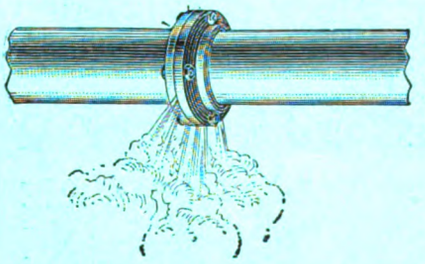

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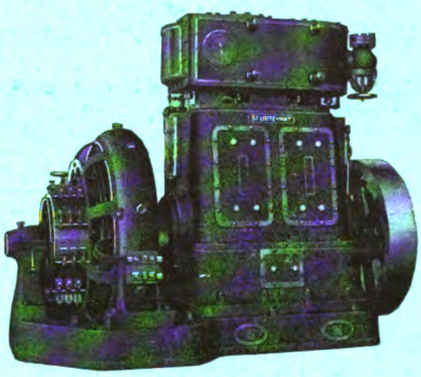

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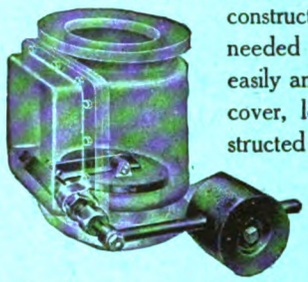

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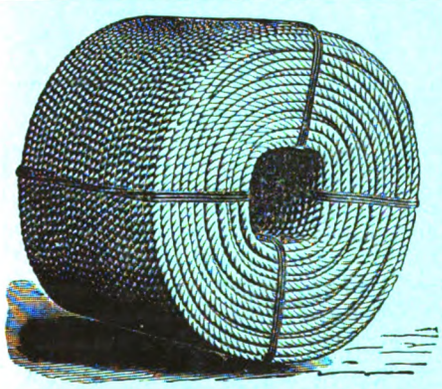

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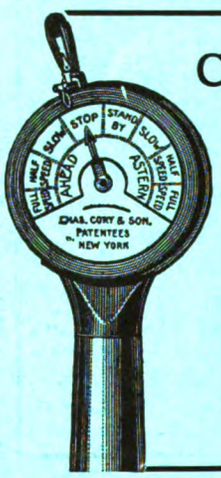

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